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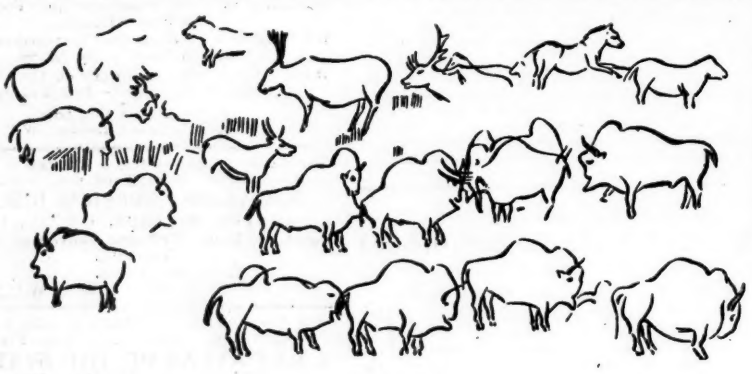

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SECTION OF SURGERY.

Sir GEORGE H. MAKINS, G.C.M.G., C.B., P.R.C.S., President.

DISCUSSION ON SURGICAL TREATMENT OF GASTRIC ULCER.

OPENING PAPERS.

Sir BERKELEY G. A. MOYNIHAN, K.C.M.G., C.B.,
Professor of Clinical Surgery, University of Leeds.

IN discussing the surgical treatment of gastric ulcer the first matter for consideration relates to the importance of discovering any sources of still continuing infection which may first have led to the development of the ulcer. The primary infection cannot always be discovered—indeed, cannot often be localized with certainty, but it is a fair assumption to make that any chronic infection of which the evidences are still discoverable may have acted as a cause of the original ulcer, or have provoked a recurrence of it in one or more of those attacks which are a characteristic feature of the clinical history. The causal infection may not be found until the abdomen is opened, for in my view a large number of the cases of gastric ulcer upon which the surgeon must operate are secondary to an infection arising in some part of the intestinal canal, more especially in the appendix. But there are not a few cases in which the infective agent appears to reach the stomach by way of the mouth. Disease of the teeth or gums, of the antrum or other accessory sinuses, or of the nasopharynx, have all been found in cases upon which I was asked to operate. If in any such case the lesion is a gross one, and likely long to continue, it is most necessary that it should be dealt with before any operation upon the ulcer itself is undertaken. If constant search is made for a diseased fang, alveolar abscesses, and septic conditions in the upper part of the pharynx or air passages, the evidence of serious disease, requiring radical treatment, will be discovered far more frequently than is generally believed. One method of inquiry worth pursuing is the investigation by *x* ray of the alveolar processes in all patients to whom a barium meal is to be given preparatory to a screen examination of the stomach. One of the factors most certainly causing a recurrence of ulceration in the stomach, or of ulceration at or near the suture line after gastro-enterostomy has been performed, is infection derived from one or other of the several sources here indicated.

The necessity for the surgical treatment of a gastric ulcer is a confession that medical treatment has failed. As commonly employed, it is doomed to failure. It too often consists in the mere administration of a bismuth mixture, when the sufferer is treated in the out-patient department of a large hospital. There is not anything approaching the necessary accommodation in hospitals in this country for the patients suffering from gastric or duodenal ulcers, whose successful treatment by medical means necessitates that constant, watchful supervision of every detail which hospital treatment alone affords. A successful operation upon a patient suffering from gastric or duodenal ulceration will depend in part upon careful and adequate preparation. Not a few of the patients are weakly, ill-nourished, and of a low resisting power when first they come under our care. By keeping them at rest for a few days, giving them large quantities of fluid by the mouth, or by rectum, or subcutaneously; by the administration in such fluid of sodium carbonate or glucose; or occasionally by performing a direct transfusion of blood, their condition can be greatly benefited, and the risks of operation correspondingly reduced. The practice of withholding fluids for a few hours before operation is always, I think, a procedure of very questionable value; in patients reduced in strength by lack of nourishment, or by pain extending over long periods, it is positively a factor pregnant with harm. When the operation is performed the choice in exceptional circumstances of hedonal as an anaesthetic is very helpful. The anaesthesia is quietly induced, lasts long, gives remarkable relaxation of the abdominal wall, and provides two or three pints of fluid at a time when fluid is much needed.

The surgical treatment of a chronic gastric ulcer* may call for the performance of one or other of the following operations:

I. Gastro-enterostomy.
II. Excision.
III. Gastro-enterostomy combined with excision by knife or by cautery (Balfour's operation).
IV. Gastro-enterostomy combined with jejunostomy.
V. Resection of a part of the body of the stomach—"sleeve resection."
VI. Partial gastrectomy.

I. GASTRO-ENTEROSTOMY.

The operation which has been the most frequently practised in the past, and is still that preferred by many operators, is gastro-enterostomy. The operation was first practised on September 27th, 1881, by Wölfler in Vienna. He was dealing with a case in which carcinoma of the pyloric part of the stomach was causing obstruction, and the intention was to remove the growth by one of the methods recently introduced by his master, Billroth. Owing to the presence of secondary deposits and the fixity of the tumour, resection was impossible, and the abdomen was about to be closed when Nicoladoni, acting as assistant, suggested that the obstruction might be relieved by making an opening between the stomach and the small intestine. The success in this, and in many similar cases, was an event of great significance, and one of the most important landmarks in the history of abdominal surgery. It was not long before examples of pyloric stenosis due to the healing of a simple ulcer were treated by the same method. What happened is known to all the world. Patients who had suffered for years from the miseries of the confirmed dyspeptic, who finally had the extreme discomforts caused by the recurrent vomiting of the stagnant and fermenting contents of the stomach, who lived on the most restricted diet in order that their sufferings might be lessened, were suddenly restored to vigorous health, were able to satisfy, without apprehension or unhappy consequences, their keen appetites; rapidly gained health and happiness, and added considerably to their weight. No operation in surgery had ever produced more striking or swifter results. Owing largely to the advocacy and the successful work of Doyen, the operation began to be practised in cases of ulcer occurring in the body of the stomach, cases in which no obstruction was caused either by the open ulcer or by the stenosis resulting from its partial cicatrization.

Results by no means so happy were soon witnessed, and in cases whose number seemed quickly to mount up the ultimate consequences of the operation were disastrous. There were several reasons for this. The chief, perhaps, was the inaccuracy of the diagnosis in many instances. It was not then, it is not now, sufficiently realized that the diagnosis of gastric ulcer is difficult and that the disease is rare. The operation came to be practised for "chronic dyspepsia," and many of the little splashes of thick lymph so often seen on the under surface of the transverse mesocolon, adherent to the posterior wall of the stomach, were assumed to be the scars of gastric ulcers which had healed. And so in many cases when the stomach was normal, where the lesion causing the symptoms lay elsewhere, the short-circuiting operation was performed, with unhappy consequences. Another reason for the disasters following upon operation was a technical one. The anastomosis was made with a long proximal loop, which, emptying with increasing difficulty, became waterlogged; or adhesions obstructed the efferent jejunum; or the opening into the stomach was badly placed. From one or other cause such difficulties as regurgitant vomiting were frequently seen. Further reasons were found in the inability of the ulcer to heal even after gastro-enterostomy had been perfectly performed in an appropriate case, and in the late

* Discussion of the treatment of the acute perforation of a chronic gastric ulcer is omitted from this paper.

development of cancer of the stomach, presumably upon the base of an unclosed ulcer.

A few years ago a revision of my own cases in which a gastric ulcer had been clearly demonstrated showed that the results could be classified into three groups.

1. *The Results were Excellent.*—With the same alacrity that is witnessed in cases of duodenal ulcer, or in cases of pyloric stenosis, the patient lost all discomforts, and made a speedy and excellent return to health. I had not then in all cases indicated in a diagram, made immediately after the operation as I do now, the exact position and the approximate size of the ulcer; and therefore I am not able to say exactly what the condition of the stomach was in this group of cases. But in many cases it is certain that the ulcer was near to the pylorus; that the gastro-enterostomy opening was on the proximal side of it. In others the ulcer was on the lesser curvature and was small, and free from adhesions. It had not, that is to say, perforated the coats of the stomach to become adherent to the abdominal wall, liver, or pancreas.

2. *The Results were Indifferent.*—Some patients were found to have improved, in many cases for periods of months or years, others were known to have relapsed. At a subsequent operation the ulcer was found to be still present; it was then removed by local excision by the cautery, or by the performance of the operation of partial gastrectomy.

3. *The Results were Bad.*—In this class of cases malignant disease developed in the base of the ulcer, and so near to the ulcer as to make differentiation impossible. The question of the degeneracy of a simple ulcer into a malignant one is still warmly debated, and there is no approach to an agreement between the several authorities. The evidence considered by the protagonists on either side is clinical and pathological.

In more than half the cases of carcinoma of the stomach treated by operation there is a history suggestive of the previous existence and of the recurrence of a gastric ulcer. No one is more ready than I am to admit that such a history is not a full warrant for asserting that an ulcer has been present. For on the clinical evidences alone a diagnosis of gastric ulcer, however confidently made, cannot always be upheld. The only certain evidence obtained before operation is afforded by a radiological examination, and I do not know of any case in which a diagnosis of gastric ulcer has been positively made with this and other methods in which carcinoma was subsequently found. The clinical evidences, therefore, however strongly suggestive, are not positive proof. In about 25 to 30 per cent. of the cases of carcinoma of the stomach removed by operation the claim that the malignant change is imposed upon a simple one appears on pathological grounds to be irrefutable; and every surgeon knows that in a small number—not less, certainly, than 10 per cent.—of the cases of gastric ulcer, to all appearances simple in character, a microscopic examination of the specimen removed by operation reveals the early stage of carcinoma. Now, histologists do not always agree as to the conditions which may be accepted as indicating the earliest changes from simple to carcinomatous states. Much of our knowledge of the microscopical appearances of cancer is based upon an examination of specimens long dead, of specimens months or years old, which have been lying upon the laboratory or museum shelves. The changes that occur in such circumstances are not known. But, as I have ventured to urge, an examination of specimens so recently removed as to be hardly yet dead is necessary before we know what conditions in carcinoma are authentic and what are the changes which are merely due to corruption. We must recognize a "histology of the living," which is probably as far removed from the histology of the dead as we now all recognize the "pathology of the living" to be from the pathology of the dead.

We must finally consider this fact also, that when gastro-enterostomy is performed for a chronic gastric ulcer, the "physiological" results of the operation, though they may not bring about the healing of the ulcer, may yet delay or prevent its progress towards carcinoma. We must take account of the possible effects produced by the change from an acid to an alkaline medium. Nothing is more remarkable than the difference in destiny of a chronic duodenal ulcer and of a chronic gastric ulcer. It is admittedly one of the great rarities in pathology to find an ulcer of the duodenum that has become malignant; and it is certainly a far more frequent thing, allowing for all reservations, to find an ulcer of the stomach in which carcinoma has developed. Embryologically the stomach and the duodenum as far down as the ampulla of Vater are one. This difference in the prospective changes in ulcers on one or other side of the pylorus may be due to the different reactions of the fluids by which they are bathed.

Those who practise the operation of gastro-enterostomy for the relief of ulcers in the body of the stomach rely upon the so-called "physiological results" of the operation—that is, upon the effect produced by the constant entry into the stomach through the anastomosis of the alkaline bile and pancreatic juice. There is no doubt that these juices are found in the contents of the stomach removed by tubage in all cases after gastro-enterostomy has been performed; and there appears to be very little doubt that the success of the best methods of therapy in cases of gastric ulcer—that of Sippy, for example—depends upon the very frequent administration of alkalis, which, it is claimed, neutralize the gastric acidity, and so allow of healing in the ulcer. Much of the explanations given is conjectural, and regard is perhaps insufficiently paid to the effect of the administration of alkalis in provoking a greater output of acid in the gastric juice to overcome the alkali administered. I am very sceptical as to any substantial "physiological" value possessed by the operation of gastro-enterostomy. Its other effects are purely mechanical. The stomach is emptied more quickly through a gastro-enterostomy opening; the pyloric spasm which so often accompanies gastric ulceration is robbed of its effects, and the persistent local spasm which causes the characteristic "incisura" may either be prevented by a division of the muscular fibres causing it or rendered ineffective by the drainage of the stomach on its proximal side.

The making of an anastomosis between the stomach and the jejunum does not prevent the subsequent development of a gastric ulcer. I have records of one case in which a gastric ulcer, well removed from the anastomosis, developed after the operation and went on to perforation; and of three others in which gastric ulceration developed after the performance of gastro-enterostomy for a duodenal ulcer.

Sherren[1] records a case of carcinoma of the stomach developing in a patient upon whom gastro-enterostomy was performed for a perforated duodenal ulcer. Coffey, a surgeon of great sagacity, in a paper on "Gastro-enterostomy still the operation for chronic gastric and duodenal ulcer," records[2] two cases in which an ulcer in the stomach developed after gastro-enterostomy had been performed for duodenal ulcer.

In consequence of my experience I have abandoned gastro-enterostomy alone in the treatment of chronic gastric ulcer, for:

(*a*) The results, even when the operation was "successful," were not so satisfactory as those which now follow gastrectomy. The morbidity was greater, the return to health slower, the ability to take food early and generously was wanting, a more watchful after-care was necessary.

(*b*) Some cases returned with the ulcer still open, and a further operation was required. In such cases the ulcer had almost always perforated all the walls of the stomach, and adhesions had occurred to the liver, pancreas, or abdominal wall.

(*c*) Some few cases returned with carcinoma of the stomach after so long an interval as to make it probable that the cancerous change had occurred after the operation had been performed. Estimates of this sort are, I admit, fallacious, for the chronicity of some forms of malignant disease of the stomach is remarkable. I have recently been consulted, on account of a return of her symptoms, by a patient upon whom four years and seven months ago I performed gastro-enterostomy for carcinoma of the lesser curvature of the stomach, causing obstruction, when secondary deposits were present in many glands, in the falciform ligament (one of these nodules was removed for microscopical examination and confirmed the diagnosis), and the liver.

(*d*) There is evidence to show that gastric ulcer may develop, even after gastro-enterostomy has been performed, when the stomach itself was normal.

The operation of gastro-enterostomy is made as simple

as possible, though it is by no means always easy. Clamps are used, and a vertical application of the highest accessible portion of the jejunum is made to the posterior surface of the stomach along a line which is a continuation downwards of the upper part of the lesser curvature. In this way the lowest portion of the stomach is drained by the new opening. Two layers of sutures are used; both are of the finest chromic catgut (six nought). It is never necessary to have more than two layers, nor to use any unabsorbable material, such as linen or thread or coarse chromic catgut. Any large vessel springing from the greater curvature and running directly on to the anastomotic line is ligatured separately. The opening into the lesser sac is carefully closed by approximating the cut edges of the transverse mesocolon to the suture line. The principles applicable in all operations are observed—gentle handling, absence of exposure or chilling of any parts directly engaged in the operation, and scrupulous care at every step. The mortality in my own hands during the last ten years is 1 per cent., and there has been no death in the last 350 cases of gastric or duodenal ulcer.

II. Excision.

The operation of excision was introduced with great hopes, which unhappily have not been gratified. I have practised excision by several routes, and have removed ulcers of various sizes. A small ulcer on the anterior or posterior surface has been excised, and the opening left in the stomach either closed by interrupted sutures of catgut or utilized to form an anastomosis with the jejunum. Wedge-shaped excision of ulcers on the lesser curvature has been carried out, sometimes with ease, oftener with difficulty, and with a resulting deformity of the stomach. Ulcers on the posterior wall, perhaps burrowing into the pancreas, have also been removed through an incision in the anterior wall of the stomach. I have been profoundly disappointed with the results. My colleague Mr. Collinson, in a paper read before the American Medical Association in 1914,[3] found that in thirty-nine cases of excision there were fifteen in which severe recurrence of symptoms was observed. Eleven patients were submitted to a second operation, and seven of them showed active ulceration at the site of the excision, one had developed a fresh ulcer distal to the original one, and three had extensive adhesions which crippled the action of the stomach. The operation may fail on account of technical errors. Too small an area of induration surrounding the actual crater may be removed; the hard, stiffened edges of the wound which remain, infiltrated by inflammatory products which have long been there, may not heal kindly or rapidly, and fresh ulceration may start before cicatrization is complete. Of such a condition I found evidence in a case of my own, related by Mr. Collinson in the paper to which I have referred. In other cases a deformity of the stomach may be consequent upon the removal of an ulcer, especially of one which lay upon, or near, the lesser curvature; the normal peristaltic movements will then be checked at the line of scar, as a radiological examination will plainly declare. The use of unabsorbable sutures, especially continuous sutures, may lead to secondary ulceration. All continuous "seromuscular" sutures probably penetrate to the mucosa in more places than one; if this occurs, the suture will eventually ulcerate its way through to the lumen of the bowel and be discharged, or hang loose at the suture line for months or years. Finally, even with a careful technique, adhesions may form between the suture line and any viscus or the abdominal wall in contact with it, and some embarrassment of the action of the stomach will then certainly result.

For these reasons, and in spite of some very satisfactory results, I have abandoned the operation altogether in cases of gastric ulcer. The disappointments it brings are too many, and are neither easy to foresee, nor certainly to be prevented.

III. Excision, by Knife or by Cautery, combined with Gastro-enterostomy.

At an early stage in our experience of the operation of excision alone it was found that in some instances, after suture of the wound was complete, a considerable degree of distortion of the stomach resulted, the lesser curvature was much puckered, and the whole organ warped in outline. To have left the stomach in such a condition would inevitably have meant that a further operation would soon be necessary in order to overcome mechanical difficulties. And little by little it became the practice to combine with the operation of excision that of gastro-enterostomy also. The results were certainly better than before, but the combined operations, in point of difficulty always, and often in point of time and of danger also, equalled or exceeded the operation of partial gastrectomy. As the technique of this latter operation was steadily improved, it began in my own hands to replace other methods, and I reverted to the practice so ably advocated by Rodman, of "removal of the ulcer-bearing area."

Balfour of Rochester, with that fertility of resource which is one of the characteristics of his fine work, replaced the method of excision of the ulcer by that of its complete destruction by the actual cautery. Balfour's operation has among its many merits that of simplicity. If an ulcer lie upon the lesser curvature, or near it, a little nearer the cardia than the pylorus, or down upon the posterior wall, the operation of excision was apt to be difficult. The method of Balfour makes the treatment very much easier, quicker, safer, and gives results far more satisfactory. I learnt the method in Rochester, where I saw several operations performed by W. J. Mayo. In ulcers near or upon the lesser curvature there is often a covering of fat, developed probably, as in the case of an infected gall bladder, as a protection against perforation. This fat is dissected upwards towards the lesser curvature, until the base of the ulcer is seen clearly. The crater of the ulcer is then completely destroyed by the actual cautery, which pierces the entire thickness of the wall of the stomach. The gap which remains is closed by interrupted sutures, in two layers, and the flap of fat turned downwards to cover the suture line like a lid. Posterior gastro-enterostomy is then performed in the usual manner.

Of all methods of dealing with gastric ulcer, short of gastrectomy, I am convinced that this is one of the best; it destroys the ulcer more completely than does the method of excision, for the effect of the cautery extends widely beyond the seared edge of the wound. If by chance there is an early carcinomatous change it is probable that much of the risk of local recurrence is removed. No more tissue is sacrificed than is necessary, and the suture of the wound offers, as a rule, no difficulty.

My own experience of this operation is small. At the time when I should have been inclined to make it an almost routine procedure for many cases I had been led by my unsatisfying experience of other methods to become more and more radical in the treatment of gastric ulcer, and to consider the removal of the part of the stomach as the operation of choice. There are, however, cases in which everyone will admit the great value of the operation: cases of ulcers difficult of access, in patients for whom, because of recent haemorrhages, or a degree of pain which has made the taking of food exceedingly difficult, the simplest operation that is sufficient to cure, or relieve the disease, is indicated.

IV. Gastro-enterostomy Combined with Jejunostomy.

This is a method which I have advocated and practised in cases of grave difficulty. The results have been excellent. There are ulcers of the stomach so large, so awkwardly placed, and so deeply penetrating the liver, or the pancreas, in patients whose general condition is so poor that any operation becomes serious. Such cases may be unsuitable for Balfour's operation, by reason of the size or remoteness of the ulcer; and for the operation of gastrectomy by reason of the extremely feeble condition of the patient, who has perhaps recently suffered from a copious haemorrhage. In all such cases I perform gastro-enterostomy in "Y," generally by the anterior route. The intestine is cut across about 18 in. below the flexure, the distal end closed, and the side of this distal part united to the anterior wall of the stomach. As large an opening as possible is made proximal to, or in the zone of, the ulcer and extending sometimes over the fundus of the stomach. The proximal divided end of the jejunum is then anastomosed to the side of the distal limb a few inches below the gastro-enterostomy opening. Into this proximal part, at a point about 3 in. above the junction which has just been made with the distal limb, a tube is introduced and fixed by the method of Witzel. The tube passes for several inches down through the entero-anastomosis into the jejunum. It is brought out of the abdominal

wall through a small separate incision to the left of the umbilicus. It is through this tube that all nourishment is given for months, or for years, until a radiological examination shows that the ulcer is healed, or until a trial of one month, during which food is given, discloses no return of the symptoms. During this time the greatest care is taken to keep the mouth clean by friction and frequent washing. I have never had any difficulty with a patient craving for food. The sufferings endured before operation, and the relief immediately afterwards, by their sharp contrast, make the patient disposed to do all one asks. One patient, whose stomach showed the largest ulcer I have ever seen (we described it as resembling the mouth of a letter box through which the hand passed deeply into the liver), took no food for two years and nine months after this operation, though I gave her permission to do so. She took food generously through the tube, and gained 4 st. in weight. Since removing the tube, now a few years ago, there has been no recurrence of symptoms. Indeed, up to the present time, in no case in which this operation has been practised has the ulcer returned.

V. Resection of a Part of the Body of the Stomach —"Sleeve Resection."

This operation is, of course, reserved for those cases in which the ulcer occupies approximately the middle part of the stomach. After resection of a cylindrical portion of the organ the cut ends are united. Advocacy of this operation appears to be restricted to a few surgeons, and consequently the number of cases performed is relatively small. I practised it on two occasions only, long ago. In both the operation promised well, but one of the patients returned after four years with an hour-glass stomach, for which a second operation was necessary. The rôle of the operation is necessarily a very limited one. I think I am hardly likely to perform it again. But so far as I can judge of the experience of others it has had a fair measure of success.

VI. Partial Gastrectomy.

My early experience of the operations already mentioned was satisfactory enough so far as immediate results were concerned; but as time passed patients began to return with one degree of discomfort or another until I was convinced that many of the methods practised were not justified by their end results. And by degrees I was brought to realize that gastric ulcer was a far more serious disease than duodenal ulcer. It was soon found to be comparatively a rare disease, far less frequent in occurrence than had been universally believed, and certainly very difficult indeed to diagnose with confident assurance and constant accuracy. The diagnosis so frequently made of "gastric ulcer" in out-patient rooms and in private practice is not sustained when the parts are examined upon the operation table. Other diseases—duodenal ulcer, chronic appendicitis, cholelithiasis, tuberculous enteritis, laxity of the attachments of the colon—are all found in the absence of any palpable or visible lesion of the stomach, and explain the symptoms of which the patient has complained. A host of diseases, organic and functional alike, are called "gastric ulcer." And consequently much of the literature and most of the statistics dealing with the subject of "gastric ulcer" lack that foundation of truth which only an accurate diagnosis can afford.

In the cases of indisputable gastric ulcer, when the ulcer is demonstrated beyond cavil by a radiological examination or by inspection upon the operation table, a far greater seriousness attaches to the disease than to the condition of duodenal ulcer. Operations upon it are more serious, partly by reason of the extent of the operations themselves, chiefly, I think, in consequence of the less robust state of the patients. Recoveries after operation are fewer whatever the nature of the operation, and the rate of mortality of the patients in the years subsequent to operation, as Balfour has recently shown in a paper of great value and of new significance,[4] is, in the cases attended in the Mayo clinic, three times as high as in patients operated upon for duodenal ulcer. This on reflection is not so startling a fact as may at first appear; for many of the patients suffering from duodenal ulcer are men otherwise of robust strength and splendid health. I have operated upon international football players, golfers, lacrosse players, and many distinguished athletes for duodenal ulcer. Such people are not often found among those who suffer from gastric ulcer; and, though there are exceptions, the types of stomach found in the two diseases are distinct from one another, as Hurst has shown. The local conditions found in the two diseases are different also. A duodenal ulcer is often a simple round "terraced" ulcer affecting the intestine alone; a gastric ulcer is very prone to extend and to burrow deeply into other parts—the pancreas, the liver, the abdominal wall; and the later history of the two diseases is very different. I lean to the belief that many of the cases of carcinoma of the stomach with which the surgeon can deal successfully have their origin in a chronic ulcer. That is not the universal view, but the opinion of those who hold it is weighty and well founded. Carcinoma is excessively rare in that part of the duodenum affected by chronic ulcer. Prompted by all these considerations, I was gradually brought to view gastric ulcer as a disease requiring direct and radical treatment, and that it was not safe to trust to the indirect method of gastro-enterostomy, which, whether its action is "physiological" or mechanical, merely produces a condition of things in which healing can more easily take place.

My choice of operation now always falls upon partial gastrectomy, whenever it can with reasonable safety be performed. The risk is not great: over a period of ten years it is not more than 2.5 per cent. All things considered, and account being taken of the five years succeeding operation, it is probably a safer operation and is certainly more immediately satisfactory than gastro-enterostomy alone. It cannot always be practised. The condition of the patient may forbid it. The ulcer may be so large and so placed as to make removal a matter of so great technical difficulty that the immediate hazards are unfair to the patient. But as experience grows the number of such cases diminishes. Nowadays I rarely practise any other operation than partial gastrectomy or gastro-enterostomy in "Y" combined with jejunostomy. The details of the operation of gastrectomy are briefly these: The duodenum is divided just beyond the pylorus, after ligature of the pyloric and gastro-ducdenal arteries. An opening is made in the transverse mesocolon, in the arch of the anastomosis of Riolan in order to guide the surgeon in his ligature of the omentum below the greater curvature, so that the middle colic artery may be avoided, and in order that the conditions at the back of the stomach may be early and fully investigated. After division of the great omentum as far towards the left as the point at which the stomach is to be divided, the whole organ is turned over the left edge of the parietal wound, until the coronary artery is brought into view and ligatured with great ease at exactly the place required. As soon as this vessel is cut an anchor is "let go," and the stomach is moved more freely. Then while the stomach is held as a retractor an anastomosis is made between it and the jejunum. I now always apply the end of the stomach to the side of the jejunum.

In my early cases I twice encountered a little difficulty in making the jejunum so apply itself to the stomach as to avoid a kink at the upper end of the anastomosis. In both cases some bilious vomiting occurred. In order to prevent this I now usually divide the jejunum completely across, about eight to ten inches below the duodeno-jejunal flexure, close the distal end, and make an anastomosis in "Y." This takes a few minutes longer, but the expenditure of time is worth while. The results are excellent. The condition after operation is remarkably good; in almost all cases the patients have the most tranquil progress that one could wish. And not one single case I have ever operated upon has had a recurrence of trouble. Once the convalescence is complete the history is without incident.

Whatever the operation from among all those mentioned which may be selected in each individual case regard must always be paid to the power of the patient to bear it, and to its exact application to the particular conditions disclosed when the parts are directly examined. Before the operation commences the surgeon should never reach a definite decision to perform any one procedure; he must apply at the moment of operation the method which best meets the indications in each case. And here, as elsewhere, the little things count. Care in preparation,

scrupulous exactitude in every detail, gentleness, deliberation, with such speed as comes naturally from much practice, and is unsought as a special feature—all these together will sometimes turn what would otherwise be failure into easy and certain success.

Statistics.

For the purpose of illustrating my practice in connexion with operations upon the stomach and duodenum I have collected together, with the help of my colleague, Mr. E. R. Flint, and my secretary, Miss Mackill, all the records of cases operated upon by myself since the year 1909, including the very lean years of war. Every case of simple disease of the stomach or duodenum (excluding acute perforation) is included: cases of gastric ulcer, hour-glass stomach, duodenal ulcer, and jejunal or gastro-jejunal ulcer following upon gastro-enterostomy.

The cases of ulceration are as follows:

Ulceration.

	Cases.	Deaths.
Gastric ulcer alone	179	
Gastric ulcer with duodenal ulcer (including some cases of hour-glass stomach)	35 = 235	7=2.9%
Gastric ulcer alone causing hour-glass stomach	21	
Duodenal ulcer alone	563	3=0.53%
Pyloric ulcer	9	0
Jejunal or gastro-jejunal ulcer	27	2=7.40%

In 4 cases the original gastro-enterostomy had been performed by me.

The greater severity of cases of gastric ulcer as compared with duodenal ulcer is strikingly shown; and the serious nature of cases of jejunal ulcer is evident.

Operations Performed.

Operation.	Cases.	Deaths.	Remarks.
Gastrectomy	80	2=2.5%	One case of almost total gastrectomy for large multiple ulcers, eroding the pancreas and the liver.
Gastro-enterostomy—			
Posterior	660		Five deaths were due to lung complications, associated in one with tuberculosis.
Anterior	8		
In "Y"	12 = 694	7=1%	
In "Y" with jejunostomy	12		
With gastrostomy ...	2		
(All these combined in a great majority of cases with removal of the appendix, and several with operations upon the gall bladder. In two ovariotomy was performed also.)			
Excision of gastric or duodenal ulcer with or without gastro-enterostomy, including Balfour's operation	42	1	The fatal case was one of duodenal ulcer; cholecystectomy and appendicectomy were also performed.
Hour-glass stomach (multiple operations, gastro-enterostomy with gastro-gastrostomy, &c.)	17	1	*Post-mortem* report: "Extreme fatty infiltration of right auricle and ventricle, chronic fibrosis of kidneys."
Jejunostomy	2	1	The fatal case had a gastro-jejunal ulcer of large size, with much induration around it. The patient was exceedingly ill, and suffering intense pain.

Summary.

There were in all 835 operations (upon 834 patients), with 12 deaths—a total mortality of 1.43 per cent. Excluding the cases of jejunal ulcer there were 808 operations on cases of gastric and duodenal ulcers with 10 deaths—a mortality of 1.23 per cent.

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WHEN I was asked to open a discussion on gastric ulcer before this Surgical Section it seemed like carrying coals to Newcastle, as so much of our knowledge of ulcers of the stomach and duodenum has been developed by the distinguished members of the British Medical Association; I refer to Sir Berkeley Moynihan, Mr. Paterson, Mr. Sherren, and many others who have actively participated in this work.

Gastric ulcer is a comparatively rare disease, representing but a fraction of 1 per cent. of the findings at general necropsies. Nevertheless, because of the chronic character of the disease with years of complaint a large number of persons, in the aggregate, are being treated for this trouble. The disease is more common in males than in females, the proportion being three to one. The proportion of gastric to duodenal ulcer is approximately one to four, as shown by reports from our clinic, where from January 1st, 1906, to January 1st, 1920, 1,191 patients with gastric ulcer and 4,532 patients with duodenal ulcer were operated on. A very small percentage of patients have multiple ulcers in the stomach and duodenum; in only 203 instances during the fourteen years were both gastric and duodenal ulcer found in the same patient. In a series of 638 patients with gastric ulcer observed in a five-year period, 28 had multiple ulcers; Sir Berkeley Moynihan, in 1902, called attention to the occurrence of this condition.

As to the etiology: ulcer is undoubtedly developed by a combination of local chemical effects, or by direct interference with the circulation through infarction emboli of bacteria. The two are most surely associated. In the diseased tissue, during the periods of varying activity and remissions of chronic ulcer, bacteria can be cultivated from excised ulcer tissue which has been made wholly free from surface contamination. If the cultures grown in such experiments are injected into animals, a high percentage of similar ulcers are produced. In the chemistry of the bacterial products, I believe, lies the explanation of the chronicity of the disease. Reeves and others have shown that in the order of frequency of selection the areas of the stomach most often involved in ulcer are on the lesser curvature, in which parallel arterioles supplied at both ends by arterial majors give an opportunity for some stasis, and should bacteria be present in the blood supply, emboli may destroy a local area of circulation, or bacterial infiltrated tissue by chemical action may bring about the same result. The relationship of pepsin and acid has always been recognized as associated with the development of these so-called peptic ulcers. The experimental surface ulcers on the mucous membrane may be produced in numbers by certain toxic materials, bacterial or drugs, injected into the circulation or administered by mouth, but such ulcers are fleeting; they are not considered in this discussion. Dr. Sippy, of Chicago, one of America's greatest internists, should be credited with having done the most to co-ordinate medical thought with regard to the condition of gastric ulcer and its medical treatment, which is based on changing the environment of the ulcer area by controlling the corrosion of gastric acids during exacerbations. He has shown that the combined acids have little to do with activating pepsin during the period ordinarily given for digestion, and that free acid is the activating agent. The medical treatment of gastric ulcer in an exacerbation during waking hours is directed towards controlling and lowering this acidity by dilution or neutralization of gastric contents each hour. The food which is permitted has a fairly high percentage of fat which delays digestion; the next hour is given to alkalis. This procedure is carried on while the patient is awake and in bed, while the symptoms are acute. Patients are under surveillance for a long period with repeated tests of the stomach's content and a regulated diet. Such treatment, although effective at least in affording temporary relief, can seldom be obtained by the majority of those afflicted. The patients may be too poor financially, or for other reasons so situated that they cannot secure the treatment. The ulcers under discussion occur in every country, in every climate, and with every type of food. Because of the years of disability such patients, with recurring attacks, who are cared for in and out of hospitals represent a fairly high, and far too high, percentage of gastric ulcer as

compared with other diseases. While they are being cared for during many years of recurring attacks, some develop conditions demanding immediate surgery, such as hemorrhage, obstruction, and perforation, and not a few develop cancer on ulcer, of which approximately 25 per cent. remain confined to the stomach (a local disease) until death occurs. Ulcer of the duodenum, however, rarely develops a malignancy. Undoubtedly many ulcers exist without recognized symptoms in hyposensitive people or in non-sensitive areas of the stomach. A few such become evident through haemorrhage or perforation.

Judging from the literature on this subject, as presented by the internist and by the surgeon, there would seem to be a wide divergence of opinion with regard to the condition and its results. Personal conversation with some authors, however, shows that their view-point is not so dissimilar as appears from the emphasis placed on certain conditions and symptoms. The internist, in urging medical care, refers to the danger of surgery. In the 4,532 cases of duodenal ulcer the operative mortality was but 1.76 per cent.; death naturally occurred in the most severe and often neglected cases, while in the 1,191 cases of gastric ulcer the mortality was 3.77 per cent.; but all admit the greater seriousness of the latter condition. Again, the internist refers to the rare bad results largely avoidable, such as the vicious circle and gastro-jejunal ulcer, and other conditions that were recently discussed by Sir Berkeley Moynihan. It is true that some surgeons performed gastro-enterostomies because of symptoms—for example, digestive reflexes, abdominal and spinal—without positively determining the presence of the ulcer. In a number of cases, to the discredit of surgery, it is necessary to cut off and close the gastro-enterostomy which has been made, although no ulcer was present, and has left the patient far worse than before the operation. We have so dealt with a few hundred cases in which the gastro-enterostomies had been advised, based on symptoms alone, since the presence of the ulcer had not been proved. Fourteen of the patients were our own who had been operated on in the early developmental period of gastric surgery on the surmise that they were suffering from ulcer on the posterior wall. The surgeon, on the other hand, appears to discredit the internist, as he never sees an ulcer in the early stage unless it has perforated or is causing haemorrhage. The larger number of patients have been under treatment by many physicians for a long period before receiving the benefit of surgery; and again, the surgeons frequently find that they are giving surgical intervention for secondary conditions, with varying symptoms of gastric disturbance which are not caused by ulcer, but are the response of the stomach in pyloric spasm induced by disease of the appendix, more commonly disease of the gall bladder, or more rarely disease of the pancreas, and although the patients have passed years in active care and treatment of their stomachs, the gastric trouble is of reflex origin.

That ulcer is not produced by traumatism is the testimony of surgeons who operate on persons who have accidentally swallowed foreign and sharp or hard materials, and on the insane who swallow their table cutlery, nails, hairpins, and similar undigestible material. Ulcer is rarely produced by direct traumatism, and if it were there would be the greatest difficulty in healing incisions for gastrotomy or gastro-enterostomy, as in securely adjusting the approximation against leakage and haemorrhage devitalization by suture of the incised area is an essential in the operation.

In the diagnosis of gastric and duodenal ulcer much attention is paid to the history given by the patient of attacks and intervals of health. The questions of relief obtained by taking food, fluids, or alkalis, and the relationship in time of appearance of symptoms to the last meal are of importance. A stomach which has developed qualitative food dyspepsia rarely has an ulcer, but represents a gastric reflex appearing within the half-hour, while quantitative food dyspepsia is usually associated with interference of peristalsis, which, if intestinal, appears at the end of the first hour. Surgery is usually indicated for relief, but not necessarily surgery of the stomach, for haemorrhage (vomited and by bowel) may come from gastric erosion, from the liver, the pancreas, or from rupture of veins within the stomach caused by splenic disease. In true ulcer haemorrhage is a symptom in approximately 20 per cent. of cases, but we pay little attention to occult blood except in unusual conditions. It is of interest, however, that in the study of a large series of our early cases of gastric ulcers about one in four patients had had haemorrhage before operation, and one in twelve suffered from haemorrhage afterward. This is an additional reason for destruction of the ulcer which we strongly recommend as well as the gastro-enterostomy, since if destruction of the ulcer alone is sufficient to cure, natural perforation and its healing should theoretically cure. Perforation is a common occurrence, without, however, relieving symptoms. It is not so serious as has been believed, since Nature usually protects by immediate stasis and adhesions.

We place great reliance in the *x* ray to corroborate the clinical history and general diagnosis of the condition. Dr. Carman and co-workers of the clinic, who have a wide experience in such cases, are able to make the diagnosis from the *x*-ray standpoint in 95 per cent. The importance of the *x* ray is very great in determining whether the ulcer is gastric or duodenal, which is often difficult or impossible clinically.

We believe with Sippy that control of the acids limits peptic activity and gives relief of symptoms, but we also agree with Moynihan that treatment but tides the patient through the exacerbation and does not cure permanently. A gastro-enterostomy, however, permanently applies the medical principle of treatment, by overcoming pyloric spasm, preventing retention of gastric secretion after food has left the stomach, and by allowing sufficient quantities of the alkaline secretion of the duodenum to pass into the stomach and lower the general acids. This fact was first called to our attention by Mr. Herbert Paterson. Dr. Lemon in our clinic, in a series of 200 cases, showed the reduction in general acids after operation to be 39 per cent., and in free hydrochloric acid 46 per cent. The change in the local environment apparently permits Nature to heal the ulcer as well as to overcome symptoms. The retention of secreted acids before operation in a stomach free of food indicates a pyloric spasm and a varying loss of balance between the neutralizing alkalis in the first portion of the duodenum and those of the stomach, and herein lies the defect of pyloric operation, which for a time relieves by removing the control of the gastric outlet, but the acidity is not changed. A high proportion of combined acids as compared with the amount of free acid indicates delay or retention caused by spasm or obstruction. In gastric ulcer the marked lowering of free acid and increase of combined acids may indicate malignant change, although the fact is admitted that cancer of the stomach occurs rarely with a high acidity. The same change in acids—lowering of free acid and increase of combined acids—is often found associated with pyloric spasm, secondary to cholecystitis and pancreatitis. Achlorhydria is seldom changed by medication or surgical intervention.

In a study at the clinic from July 1st, 1914, to July 1st, 1919, of 647 operations, on 638 patients with calloused ulcer of the stomach, it has been shown that the average mortality was 3.2 per cent., more than double the average mortality in 2,734 operations performed in the same period on 2,720 patients with duodenal ulcer. Five hundred and thirty-four ulcers were located on or around the lesser curvature, eighty-five involved the posterior wall, nine were on the greater curvature, and five on the anterior wall; the location of five was not definitely recorded. Of those on the posterior wall 8.2 per cent. were in the pyloric third, 73.3 per cent. in the middle third, and 16.5 per cent. in the cardiac end. All were of the chronic perforating variety, and fifty-three were attached to and involved the pancreas in the ulcerative process. Fifty-seven of these eighty-five patients were males and twenty-eight were females; their ages varied from 18 to 69, with an average age of nearly 44; the average duration of symptoms was 6½ years. At the clinic investigations for many years have led us to reiterate the assertion that gastric ulcer is potentially malignant, although at *post-mortem* examination for extensive disease causing death, it may be impossible to determine that an early ulcer was present. Many ulcers that we have excised and considered benign showed the presence of carcinoma in a limited area of the margin. We believe that Aschoff is correct in his assertion that if the lesion is cancer originally the base of the ulcer will prove to be cancer, but in our cases the cancerous area was in the margin only, and therefore we considered cancer developed on ulcer as shown by Wilson and MacCarty.

Balfour, on the theory that malignant cells are much more vulnerable to heat than normal cells, suggested and developed a slow destruction of ulcer by perforation with the cautery and immediate closure and gastro-enterostomy.

In the removal of perforating posterior ulcers of the stomach attached to the pancreas we use the upper approach through the gastro-hepatic omentum. The finger is hooked around the attached ulcer area and the ulcer shaved from the pancreas, its margins are cut away with a knife or cautery, and the opening closed with chromic catgut sutures. To protect and mobilize this area of the stomach a gastro-colic omental opening is made between the stomach and the colon, and the tip of the omentum is drawn through the opening and plastered over the posterior wall of the stomach to which it is fixed by sutures, covering the area from which the ulcer was excised as well as the pancreas, as suggested by William J. Mayo; a posterior gastro-enterostomy is also made.

In eighty-nine operations performed in the clinic for hour-glass stomach the operative mortality was 7.4 per cent. Of the various methods of excision and plastic enlargement of the stomach for the relief of this most distressing condition we now prefer to perform the sleeve resection of the central portion of the stomach, usually with gastro-enterostomy. If there is a recurrence, we remove the lower half at the second operation, uniting the narrowed proximal portion to the jejunum. For extensive ulceration and thickening, as well as local cancer in the pyloric region after resection of the stomach, as a *rule* we also make the same type of union of the stomach with the jejunum, although in some cases the Billroth No. 1 method of reuniting the duodenum to the stomach has been accomplished with good success. I first saw the end-to side union of the stomach and the jejunum in 1912 in Germany and in Austria, where it was called by some the Hofmeister operation, and by others the Enderlin. Later we found it had been described by Polya in 1911. I performed five of these operations in 1913. After division of the stomach the proximal end was drawn through an opening in the mesentery of the transverse colon to which it was sutured and the jejunum applied to the whole of the cut area of the stomach, a large opening being made and the duodenal division being closed by suture. Mr. Sherren, in a recent number of the *Lancet*, describes the method as one he began using in 1911, but he does not state when it was first described. He is mistaken in believing he introduced the operation in America as late as 1914. We found that in some cases this operation gave trouble from traction of the transverse colon on the stomach, and, when it was made for cancer, recurrence produced early obstruction. Balfour obtained a higher percentage of good results by making the same attachment of the jejunum anterior to the colon, and we have adopted this method and found it highly successful. In large openings in the end of the stomach I have found additional advantage in partial closure and covering the closed portion with unopened jejunum held by suture. By turning the jejunum to the right a loop of fourteen inches is sufficient to provide for the drop of the colon, the jejunum passing around to the left of the sagging transverse colon and coming out of its splenic flexure so that it receives no pressure from the colon.

Gastro-jejunal ulcer is an unfortunate condition which occurs in a small percentage of patients who have been primarily relieved by gastro-enterostomy, but even the present small percentage of occurrence can be markedly reduced, I believe, by avoiding the use of permanent suture material for the temporary requirement demanded in the ordinary case of gastro-enterostomy; undoubtedly it can be lowered still further if more attention is paid to freeing the patient of the foci of chronic infection, usually streptococci, which give the opportunity for new infarctions at the point of gastro-jejunal union, often before healing is completed.

Up to January 1st, 1920, we had operated on 83 cases of gastro-jejunal ulcer, of which 47 followed a gastro-enterostomy performed in the clinic for benign duodenal or gastric ulcer and 36 followed primary operations elsewhere. In a number of this group the permanent silk suture was found hanging in the ulcer indurated area, and in others it had apparently but recently passed out; in 4 cases we have seen the sutures hanging from the ulcer area and exposed to the gastric fluids four years following the operation. In such conditions the patient complains much as before the operation, the trouble being more continuous. The *x* ray gives valuable aid in the diagnosis of gastro-jejunal ulcer in about 80 per cent. of cases. In three instances we have seen such ulceration perforating the colon, producing a gastro-jejunal colic fistula. If the ulcer area is small its excision is advisable, re-establishing the opening by catgut suture. In extensive areas of ulceration and partial closure the gastro-enterostomy was undone, the bowel and the stomach closed; in a few cases it was found advisable to enlarge the pyloric outlet by some of the plastic methods.

Gastric ulcers should receive special consideration because of the seriousness of perforation, chronic symptoms, and frequent deformity and fixation of the stomach and the not infrequent development of carcinoma, and because the results following gastro-enterostomy for gastric ulcer are certainly not so good as following gastro-enterostomy for the relief of duodenal ulcer. Graham, in an investigation of 438 cases of duodenal ulcer, found that from the standpoint of the patient 70 per cent. who survived operation considered themselves well following gastro-enterostomy, 27 per cent. were improved, and 3 per cent. unimproved.

The future condition and length of life of these persons is a problem recognized by insurance companies in considering the applications for insurance of those who have had operations for gastric ulcer. Hunter, actuary of the New York Life Insurance Company, in an investigation at the clinic of the results of operation in a large series of cases of gastric and duodenal ulcers, found that the average death rate for the four-year period after operation in patients with gastric ulcers was slightly more than three times the normal, while in the duodenal ulcers it was slightly less than normal. The series consisted of 2,431 patients, and all but 108 were traced.

Conclusions.

If it is true that the majority of the cases of duodenal and gastric ulcer have an average duration of a number of years, many extending from twenty to thirty years, it is probable that there is an exaggerated idea of their danger to life. Few persons die from perforation, and few from haemorrhage—more, however, than die from surgical procedures. It is true that they suffer, are disabled, and should be relieved; and it is also probable that but a small percentage of the total number of ulcers are recognized or treated for the true condition. Gastric ulcers may give greater discomfort than duodenal ulcers, and, because of the danger of malignant degeneration, should be destroyed at the time of the operation unless this procedure would add unwarranted immediate risk. I believe patients who suffer from gastric ulcer should be told of this danger.

In fact, the surgical treatment of ulcer is the best recognition of the value of medical treatment by permanently overcoming delay or obstruction and lowering the acidity with the patient's own alkalis.

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MR. PATERSON said that the correct application of any surgical procedure depended on a proper appreciation of its effects. Clinically, therefore, it was of the utmost importance to determine whether in the treatment of gastric ulcer, the operation was purely mechanical or had any physiological effect on the gastric activities. Sir Berkeley Moynihan had said that "we must consider this fact also, that when gastro-jejunostomy is performed for a chronic gastric ulcer, the physiological results of the operation though they may not bring about the healing of the ulcer, may *yet delay or prevent its progress towards carcinoma*." That seemed to indicate a change of view, but later on Sir Berkeley Moynihan said, "I am very sceptical as to any substantial physiological value possessed by the operation." Possibly these opposed statements indicated that Sir Berkeley Moynihan was in a state of philosophic doubt. Sir Berkeley Moynihan, Mr. Paterson thought, was a living illustration of the words of the greatest of American writers: "a foolish consistency is the hobgoblin of little minds." He was never afraid to change his views and to admit the alteration of his opinions.

I think, Mr. Paterson continued, that the beneficial results of gastro-jejunostomy cannot be attributed to hastened evacuation of the stomach. Hastened evacuation is a far from constant result of gastro-jejunostomy.

Is there any constant effect of gastro-jejunostomy on the condition of the stomach contents? There is—namely, a definite and constant increase in the mineral chlorides. To what is this due? The conclusion is irresistible that it is due to small quantities of bile and pancreatic juice gaining entrance to the stomach through the anastomosis. This is nature's method of alkaline medication, and is a very different thing from the intermittent action of alkalis administered by the mouth, the effect of which is to stimulate the secretion of acid.

The fact that gastric ulcer sometimes recurs after gastro-jejunostomy is not incompatible with the physiological explanation of the operation. The hyperacidity before operation may be such that the amount of alkaline juices which backflow into the stomach are insufficient to neutralize the acid gastric contents. We must also bear in mind that gastric ulcer is by no means frequently associated with hyperchlorhydria, and it is not always excess of acid but the continual presence of a weak acid which keeps up the ulceration. So after gastro-jejunostomy indiscretions in diet may produce hypersecretion, and the constant action of a weak acid in the stomach contents may lead to recurrence of ulceration. The work of Dr. Charles Bolton has an important bearing on this question.

One other point: with regard to the grafting of malignant disease on simple ulcer—Sir Berkeley Moynihan has admitted that the clinical evidence is inconclusive—I would go further and say that there is no clinical evidence of any scientific value concerning such a happening. He has admitted the uncertainty of a diagnosis of gastric ulcer from the history. Nor is the pathological evidence more convincing. Doctors Wilson and MacCarthy state that in 71 per cent. of their cases there was "a large ulcer with scar tissue centres and overhanging border, deep in the bases of which cancer is present. Further, almost every case gives a clinical history suggesting gastric ulcer for a long period of years preceding the relatively short period when the history became that of gastric carcinoma." Apart from the assumption that a previous history of gastric trouble is evidence of gastric ulcer, the weak point of this argument appears to be the absence of proof that an ulcer in which cancer cells are present has ever been other than malignant. The presence of scar tissue is not necessarily evidence of non-malignancy. Further, the border line between a benign and a malignant growth is a narrow one, and a given tumour may be inherently malignant before, clinically or pathologically, we can recognize its malignant character with the means at present at our disposal. There remains this solid fact: Patients on whom gastro-jejunostomy is performed for gastric ulcer rarely die from gastric cancer. Professors Kocher and Grenot estimate the proportion as less than 3 per cent. In my own experience the proportion is less than 2 per cent.

If, however, carcinoma supervenes in anything like the proportion of ulcer cases alleged, then a considerable number of patients who have had a gastro-jejunostomy performed for gastric ulcer ought subsequently to die from gastric cancer. They do not do so; therefore, either carcinoma does not originate in gastric ulcer very often or, if it does, then gastro-jejunostomy stays the progress of the carcinoma. This is a dilemma from which there is no escape. Either carcinoma is not often grafted on a simple ulcer, or, if it is, then gastro-jejunostomy cures cancer. Clearly, therefore, this argument for the performance of partial resection in preference to gastro-jejunostomy falls to the ground. I do not dispute that partial gastrectomy is advisable and necessary in certain cases, but do let us be sure of our principles and not use arguments in favour of the more severe operation which are not conclusive and not supported by solid facts.

One last point. Gastro-jejunostomy is but an incident in the treatment of gastric ulcer. Prolonged and careful after-treatment is of no less importance than operation.

A. H. BURGESS, F.R.C.S.,
Manchester.

MR. BURGESS emphasized the importance of clearly recognizing the two objects aimed at in the surgical treatment of gastric ulcer—(1) to get rid of the ulcer itself, and (2) to cure the abnormal condition allowing of its continued existence—that is, hyperacidity. Both objects were necessary for success. The former was attained by excision of the ulcer, or by Balfour's method of destruction with the actual cautery. Mr. Burgess much preferred a clean-cut excision to the cautery, the range of action of which was difficult to control; the latter was attained, so far as it was possible to attain it by surgical means, by gastro-enterostomy. Neither excision alone nor gastro-enterostomy alone was sufficient; a combination of the two was the ideal procedure. But in actual practice it was often an easier and a quicker operation to perform partial gastrectomy, and he now agreed that that was in most cases the better procedure. Where, however, the ulcer was very high up on the lesser curvature, almost the whole stomach would require removal, and in these cases he still preferred a local excision of the ulcer (the wound in the stomach being sutured transversely), combined with gastro-enterostomy. He referred to the help given to partial gastrectomy by the inter-colo-epiploic route described by Pauchet of Amiens; it allowed splendid access to the posterior wall, and complete avoidance of all danger to the middle colic artery. Mr. Burgess believed firmly in the so-called "physiological" action of a gastro-enterostomy. The advantages of making a large opening between the stomach and jejunum, almost universally agreed upon, were easily explicable on the "physiological" theory, but if gastro-enterostomy were a purely "drainage" operation, then there was no great object in having the opening larger, ultimately, than the cross section of the efferent loop, since the width of a drain was that of its narrowest point.

He urged that more attention be paid to the after-treatment of these cases, and that the diet of all these patients should be carefully regulated subsequently. He advised all his patients to take alkali in some form almost as an article of diet after gastro-enterostomy.

CHARLES RYALL, F.R.C.S.,
London.

MR. CHARLES RYALL said that in considering the question of the surgical treatment of gastric ulcer it was well to remember that the ulcer was the outcome of a simple inflammatory process, and that it was very similar to any other simple chronic ulcer, such as that of the leg. The causes were probably predisposing and exciting; though the former, such as hyperacidity in the stomach, ulcer and vascular stasis in the leg, might be easy to surmise, the real exciting cause was more difficult to determine. Dr. C. Mayo's observations and research in gastric thrombosis or emboli might prove to be of great importance in solving the problem. The question whether gastric ulcer could be made to heal was answered by the fact that not only were healed scars found in the stomach, but other cicatrizations, causing pyloric stenosis and hour-glass contractions. Ulcers of the leg healed if they were given rest unless they were fixed to the parts beneath by a fibrotic bed of scar tissue, occluding the blood supply, and it was just the same with gastric ulcer, when mobile and not fixed: when given rest it would heal. To give it rest, both mechanical and physiological, gastro-enterostomy was necessary. Paterson had pointed out the advantage of physiological rest, and in Mr. Ryall's opinion too much credit had not been given him for the work he had done.

Mr. Ryall considered that it was unsafe to dogmatize as to what should be done in cases of gastric ulcer before an exploratory operation was performed. He did not believe that any set or fixed operation was applicable to all cases. It was therefore wise generalship to be guided by what was found. When on exploration the ulcer was found a gastro-enterostomy was essential.

It was necessary also to determine whether the ulcer was likely to bleed, liable to perforation, or likely to interfere with function by the formation of a deforming cicatrix. These types had undoubtedly to be dealt with by extirpation. The application of the cautery was undoubtedly useful, but it was not free from risk of being followed by haemorrhage unless the chief vessels of the part were secured by underpinning, and one could underpin freely in the stomach without fear of necrosis. He was not in a position to say that every ulcer of the stomach must be excised.

That there was some relation between chronic ulcer and cancer was indisputable, but his opinion was that too

much importance had been attached to the incidence of cancer and chronic ulcer. It was only by working on with persevering observation that the surgeon could hope to attain the high standard of treatment aimed at by Sir Berkeley Moynihan.

Brigadier-General JOHN FINNEY, Hon. F.R.C.S.Eng.,
United States Army Medical Service.

DR. FINNEY was greatly interested in the discussion, especially in consideration of results. He personally had found difficulty in determining the true nature and actual cause of the ulcer. The diagnosis was not easy from any point of view, and he had to admit (he spoke from the heart) that sometimes he had not been able to decide whether an ulcer were present or not, even when the stomach was in the wound, in his hands, before his eyes. His cases had not responded as he had hoped to treatment, whether by excision or by any other procedure, so he now found himself, when the abdomen was opened for supposed gastric ulcer, with a very open mind. He had gone through the whole gamut of operations for the treatment of gastric ulcer and had failed to effect a cure a sufficient number of times to make him sceptical about laying down any hard and fast rule. It was possible to get certain general principles fixed in one's mind after a time, and to possess certain strong impressions, and it was these which influenced action in individual cases. Every case was a law unto itself, and uniform results from one procedure in all cases were unattainable. His own predilection was for pyloroplasty, because in cases in which he was unable to decide whether an ulcer was present or not an examination could be made of the internal stomach wall, and in some cases of ulcer of the anterior wall of the stomach the disadvantages of gastro-enterostomy were avoided by a pyloroplasty. However, he found himself gradually enlarging that group of his cases in which resection was the preferable operation, and so far he had had no mortality in that operation. But he still admitted that each case he operated on he was sorry for.

WILLIAM BILLINGTON, M.S., F.R.C.S.,
Birmingham.

THE ease and certainty with which the symptoms of ulcers of the stomach can be relieved by operation depends very largely upon the site of the ulcer. Those situated at or near the pylorus are almost invariably cured by gastro-enterostomy alone. As the site of the ulcer passes from right to left the difficulty in obtaining successful operative results increases. Sir Berkeley Moynihan's experience is common to most surgeons, and I am able to confirm in every detail what he says with regard to the unsatisfactory results of excision of the ulcer without gastro-enterostomy, excision of the entire segment of the stomach in which the ulcer is situated—the "sleeve" operation—and ordinary posterior gastro-enterostomy with or without excision of the ulcer. Some years ago I excised the ulcer widely and sutured the opening without performing gastro-enterostomy in 25 cases. Only those cases were selected in which the excision could be carried out easily and without producing deformity. The results in this series were the worst that I have had, except where the "sleeve" operation was performed, when the results were equally bad. When posterior gastro-enterostomy was performed for ulcers in the body of the stomach, with or without excision of the ulcer, the results were better but uncertain.

Provided that the ulcer is within the stomach there can be no inherent difference in its pathology whether it be situated in the pyloric portion, the middle portion, or the cardiac end. Given an ulcer of the same extent and depth difference in situation can alone account for the different results obtained. Sir Berkeley Moynihan proves this absolutely, but he gives no satisfactory explanation of the cause. He rightly, in my opinion, discredits the contention that the beneficial result of gastro-enterostomy in some cases is due to the admission of alkaline intestinal fluid into the stomach at an early stage of digestion. We are all familiar with the nausea and discomfort of which patients complain when such regurgitation occurs to any extent—that is, when a mild vicious circle insufficient to cause actual vomiting follows the operation, and experience teaches that absolutely satisfactory results follow gastro-enterostomy combined with jejuno-jejunostomy where little or no intestinal content leaks into the stomach.

I believe the underlying factor to be the effect which an ulcer penetrating deeply into the muscle of the stomach wall has upon peristalsis. Stomach peristalsis is a far more composite affair than intestinal peristalsis. Time does not allow of my elaborating the point, but a surgical ulcer of the stomach appears to have the same effect upon peristalsis that a bridge has upon the vibrations of a violin string—the parts of the string on either side of the bridge vibrate separately and independently. In other words, the ulcer physiologically, though not necessarily anatomically, divides a single stomach into two, and these can never again be converted into a single organ. The scar resulting from excision of the ulcer acts in the same way as the ulcer. Acting upon this supposition, I have for some time now regarded every stomach with an ulcer situated in the body as an hour-glass stomach and treated it as such, that is, by a long anastomotic opening which extends well on either side of the line of the ulcer, or by a double anastomotic opening. The essential thing is to establish an opening on either side of the ulcer. Though not able to give actual statistics, I have now carried out this treatment in about 50 patients, and the results have been more satisfactory than any I have previously obtained. Sir Berkeley Moynihan excises the distal pouch together with the ulcer, leaving the patient with the proximal pouch only. In his experienced hands this has proved a comparatively safe procedure, but it cannot be regarded as other than a very severe operation, and is only applicable in a proportion of cases. Double gastro-enterostomy is comparatively simple and safe, and applicable to almost every case of ulcer of the body of the stomach. When the posterior operation is impracticable the anterior method is employed, and no great difference in results is observable. I am, however, with increasing frequency, carrying out a jejuno-jejunostomy at the same time, there being greater risk than in an ordinary gastro-enterostomy of a mild form of vicious circle being established.

R. P. ROWLANDS, M.S., F.R.C.S.,
London.

WE all owe a great debt of gratitude to Sir Berkeley Moynihan, Dr. Mayo, and others, who have taken so much trouble to collect and bring to this meeting the instructive statistics of their brilliant results in such a large number of gastric operations. Their work is and has been for a long time an inspiration to all surgeons and a revelation to most physicians.

It is now generally admitted that gastric ulcer is much rarer than we used to think and that its clinical diagnosis is often at fault, even with the aid of the *x*-ray examination and fractional chemical analysis of the gastric juice. In many cases an operation is still necessary to establish the diagnosis without delay, and a microscopic examination of the ulcer is the only certain way of proving the absence of early carcinoma. Therefore an operation for supposed gastric ulcer should always begin with an exploration of the whole abdomen and be followed by a detailed examination of the stomach. Any distant source of infection should be removed if possible, and no operation should be performed on the stomach unless there is a visible and palpable gross lesion of it. The choice of the best operation for such cases ought not to be made until the exact conditions are known.

Many of the poor results following gastro-jejunostomy have been due to its performance in unsuitable cases, and many others are due to errors of technique too often arising from insufficient knowledge and experience. Before performing the operation, which is too often considered simple and easy, without due regard to the ultimate functional result, a surgeon should take pains to practise it on the cadaver and perform it first on the living only under the direct supervision of a master hand. Like marriage, a gastro-jejunostomy should not be taken in hand inadvisedly, lightly, or wantonly, but reverently and discreetly, for the patient has to live with the anatomical and physiological results of the operation, and it is vital for his recovery and comfort that the very best known method should be adopted. The removal of a useless organ, such as the appendix, is a very different affair.

In spite of what some previous speakers have said, I still think that gastro-jejunostomy is a very good operation for the treatment of pre-pyloric ulceration, and even of small soft movable ulcers elsewhere. Almost invariably it

immediately stops pain and spasm, often very severe before the operation, and allows the patient to eat plenty of nourishing food, and thus enables the ulcer to heal in the majority of cases. I believe that the operation has physiological as well as mechanical results, and that the diminution of the hyperacidity of the gastric juice by the flow of bile and pancreatic juice into the stomach is a very important element in the cure of the ulcer, probably far more powerful and constant and certainly far less irksome than the frequent administration of alkalis by the mouth. Cauterizing the ulcer can be added with advantage in suitable cases, after Balfour's method.

It seems a pity to abandon a good, comparatively simple and safe operation because its results are not perfect in every case. Sherren reports over 85 per cent. out of 187 patients perfectly well for over two years after the operation. It would seem wiser to be more careful in the selection of cases, and to limit the operation to those already mentioned, reserving the more severe, difficult and dangerous operations for large ulcers which have become adherent to the pancreas, liver, or abdominal wall, or are suspected of malignancy. If partial gastrectomy becomes the most common operation for gastric ulcer and is performed by a large number and variety of surgeons the mortality will be very serious. Even in specially skilled hands it is about five times that of gastro-jejunostomy. The very nature and severity of the operation will always make it more dangerous than gastro-jejunostomy. What is right for an expert himself is not necessarily right for him to advise others less expert than himself to do, and partial gastrectomy is clearly an operation that should be reserved for experts. However, the fact that we cannot be sure whether an ulcer of the stomach is innocent or malignant, and that in a small proportion of cases even the most experienced surgeon is sure to make mistakes, is the strongest argument of all for more frequently adopting the more radical operation of partial gastrectomy. It is certain to become more popular with skilful surgeons on this account, and because of the excellent functional results and the freedom from recurrence of symptoms. Time only will show whether secondary ulceration will follow partial gastrectomy, but, owing to the small part of the stomach usually left, it would appear unlikely.

It seems to me that Moynihan's method of joining the jejunum to the stomach may possibly be followed by jejunal ulceration, and as the anterior direct method of Mayo with reversion of the jejunum avoids the kinking which Moynihan mentions as the reason for his Y modification, this modification seems unnecessary. I should also fear the same complication after his method of gastro-jejunostomy with jejunostomy, for a considerable length of the jejunum would presumably be bathed with undiluted gastric juice. I think, however, that this operation is an excellent one for what hitherto appeared to be an intractable but small group of cases.

THE PRESIDENT OF THE SECTION.

SIR GEORGE MAKINS said that he had listened with great interest to Mr. Paterson's arguments in favour of the good which followed gastro-enterostomy being due to purely physiological results, but his experience had been that where the operation had been performed on account of mechanical obstruction of the pylorus the results had been the most satisfactory and delightful. His view, Sir George Makins said, was that the mechanical influence of the operation was that which was most important and most effective.

In regard to the question of development of malignant disease, he thought there could be no doubt that carcinoma did follow upon and in an ulcer. Cancer did follow simple ulcer of the leg, though not frequently; it might be a more common consequence in the stomach, though no evidence had been produced to show that a considerable proportion of stomach cancers did follow simple ulcers.

He wished to congratulate the Section on the success of the discussion.

REPLY.

Sir BERKELEY MOYNIHAN said: The discussion has been wide, but has revealed few disagreements on principles, so that there is little which calls for reply. The point which I mentioned in my opening remarks needs emphasis once again: that no operation is applicable to all cases, nor to all patients; the conditions of the ulcer and the state of the patient both require anxious consideration. The performance of gastro-enterostomy alone has given results which in early days of surgical work were properly considered as satisfactory. But as experience has grown and technique has improved, better results than are given by this operation are, in appropriate cases, within our reach, and should be afforded to our patients. Take Mr. Paterson's cases, for example. In a recent publication, so far as I can accurately read his figures, in cases in which gastro-enterostomy has been successfully performed, the mortality from the later development of cancer of the stomach is as great as the mortality of that primary gastrectomy which would have cured the patient once for all. The same is true, I think, of Dr. Coffey's cases, though neither he nor Mr. Paterson distinguish in their reports between the operation as performed for gastric and for duodenal ulcers. I do not plead for the invariable performance of gastrectomy. But surgeons will find that the performance of gastrectomy will steadily increase in their practice.

With regard to the "physiological" effects of gastro-enterostomy. This implies that the bile and pancreatic juice, in entering the stomach through the new opening, tend to alkalinize the contents of the stomach. Now, the normal reaction of the stomach contents is acid; the cells of the gastric mucosa live their lives and perform their due functions in an acid medium. If a word should describe the condition brought about by gastro-enterostomy—a condition which is the very denial of normal physiology—it should be "antiphysiological."

Hyperchlorhydria is not the rule in cases of gastric ulcer. In my own cases it has been present in less than 30 per cent. Smithies has shown that in 2,168 cases of *proved* gastric ulcer (which is quite a different thing from "gastric ulcer"), the free HCl values were absent or below normal in 25.6 per cent., normal in 41 per cent., and above normal in 33.4 per cent. Therefore the "physiological" value of the operation can only be necessary in one-third of the cases; and in none of the cases is there yet any proof that an ulcer of the stomach heals better in an alkaline than in an acid medium. But if a "physiological" result is needed, gastro-enterostomy is not the best method of producing it; it would be better to join the gall bladder to the stomach.

THE DIAGNOSIS OF GLAUCOMA.

BY

ROBERT H. ELLIOT, M.D., F.R.C.S.,

Lieutenant-Colonel I.M.S. (ret.).

THE invitation to address you to-day on the subject of the diagnosis of glaucoma suggested that I should lay special stress on the great advance which has been made during the last few years in our knowledge of the disease. That advance has been especially fruitful in two directions: (1) In the accuracy of the methods of our diagnosis, and (2) in the efficacy of our operative methods. Though we are primarily concerned to-day with the former of these considerations, it will be impossible to do justice to our theme if we fail to realize that the recent great advances in glaucoma surgery have entailed a grave responsibility in the exercise of the available methods of diagnosis.

We may roughly divide the history of glaucoma into three great periods: The first of these began over four centuries before the dawn of the Christian era with the mention of the disease in the writings of Hippocrates, and extended in nebulous mistiness for more than 2,250 years. The second period was ushered in by Helmholtz's invention of the ophthalmoscope in the year 1851, for this discovery opened up an entirely new path for the diagnosis of glaucoma, and thus paved the way for an intelligent understanding of the pathology of the disease. It was an era of solid and wonderful progress, and many great names are associated with it. Time does not suffice to speak of Weber's discovery of cupping of the optic disc, or of the magnificent work done by Bowman, Mackenzie, Leber, Stellwag, and others, but there are certain names over which we must linger. It was Laqueur who, in 1876, introduced us to meiotics; it was von Graefe who, in 1857, advocated iridectomy; and it was de Wecker who, whilst championing his master's teaching, first saw clearly what that master had only dimly apprehended—namely, the value of the filtering

scar. Last but not least, I would mention the name of a great Englishman, fortunately still with us, who, by an epoch-making and lifelong study of the disease, has made a firm road for us all to follow, and has thus been indirectly responsible for a large part of the progress on which we congratulate ourselves to-day. I need hardly say I refer to Mr. Priestley Smith. The third cycle began in the year 1906, when the magnificent work of Lagrange inaugurated a new era under whose auspices we meet to-day. The introduction of the operation of sclerectomy by that great Frenchman materialized the dreams of von Graefe and de Wecker, converted their longing foresight into the practical triumphs of the surgery of to-day, and gathered glaucoma into the list of curable diseases. I should be remiss indeed if I failed to mention the services to ophthalmology of Stellwag, who introduced sclerotomy, and of Herbert, who—even before the writings of Lagrange—was doing magnificent pioneer work in his search for an ideal method of securing a filtering cicatrix, a task on which he is still engaged. You will see from the list I have quoted that neither Great Britain nor her great ally France has cause for anything but pride in the past pages of this volume of the history of ophthalmic surgery.

We stand in a very different position from that of the surgeons even of fifteen years ago; but I would remind you that privileges bring corresponding responsibilities. When the treatment of glaucoma was all but hopeless, it mattered comparatively little whether we could ascertain beyond the shadow of a doubt whether the disease was progressive and at what rate the advance of the signs and symptoms was taking place. I hold it as an article of faith that to-day the great majority of cases of glaucoma can be arrested if only the diagnosis is made at an early stage and the treatment used is rational and correct. Success or failure depends very largely on the methods of diagnosis employed, and on the care and attention given to each individual case.

Let me make it clear at the outset that our present refinements in diagnosis help us in three distinct ways: (1) They enable us to recognize with certainty the presence of glaucoma even at a very early stage, and probably before any permanent damage to vision has occurred. (2) As soon as we have diagnosed glaucoma, they put it within our power to ascertain with ease whether the disease is progressive or not, and, if the former should prove to be the case, to measure accurately the rate of advance of the pathologic process. (3) They furnish us with a means of estimating the value of any treatment we adopt for the arrest of the disease.

We must now speak of the methods of diagnosis at our disposal, but it need hardly be said that the time allotted for this lecture only permits of our doing so in the barest outline.

The Ophthalmoscopic Evidence of an Increase in Intraocular Pressure.

I confidently assume that you know all about the typical pathologic cupping of the optic disc in the later stages of glaucoma and its accompanying atrophy. There is, however, a much earlier and a much more delicate sign than this, namely, an increased pulsation of the retinal vessels. In most normal eyes a slight venous pulse can be distinguished, either where a vein first emerges from the substance of the optic nerve or where a distinct bend in the vessel takes place. If the pressure within the eye rises, one of the first results is an accentuation of this venous pulse. If a further rise in pressure takes place, the pulse is communicated to the arteries as well as to the veins, and may become a very marked feature of the ophthalmoscopic picture. When the surgeon is in doubt as to whether a retinal pulse is present, he may accentuate it and make it readily visible by pressing gently with his finger tip on the ball of the eye, through the upper lid, whilst continuing the ophthalmoscopic examination. To summarize: Marked venous pulsation in a doubtful case is suspicious; arterial pulsation is more than suspicious, unless some other explanation of its presence is available.

There is another way in which a doubtful pulsation may be rendered demonstrable—namely, by the use of a mild mydriatic, such as cocaine, euphthalmin, or even homatropin. This is deliberately done by certain foreign surgeons, but I would caution the practitioner against it, unless very careful safeguards are provided; a meiotic should always be instilled afterwards, and the patient should be kept under observation until all danger is past.

Mechanical Tonometry.

The old rough and ready method of finger tonometry is only of value as a preliminary test. Not one of you would pretend to measure a patient's temperature by placing your hand upon his skin; you would use a clinical thermometer. In like manner the modern ophthalmic surgeon estimates the pressure within the eye by means of a carefully devised mechanical instrument known as a tonometer, which measures the tension of the coats of the globe, and so, by inference, arrives at a reliable estimate of the pressure to which the fluid within the eye is subjected (Fig. 1). It is impossible now to enter into details on this subject, but there are certain elementary facts to which I desire to invite your attention, since they are of practical interest to your patients and therefore to yourselves: (1) The taking of a tonometric measurement is quick, easy, and painless; (2) in the hands of an expert it causes no alarm to the patient and is quite devoid of danger; (3) it practically eliminates the personal element involved in the surgeon's hopes, desires, and fears; (4) clinically, it is a reliable instrument, especially in the matter of comparative readings between the two eyes, or of one eye at different periods.

FIG. 1.—Schiötz tonometer.

When the indications given by the tonometer are positive, they are of great value; when they are negative, they do not rule out the presence of glaucoma unless they have been repeated under different conditions and at different times of the day and night; in other words, continuous readings may be required. When this is the case, it is better, especially in old patients, to carry out the examination in a nursing home or hospital.

(1) Accurate tonometry is of the greatest value in the positive diagnosis of glaucoma, especially when the record differs in the two eyes. (2) Readings taken from time to time often throw much light on the course the disease is taking. (3) The value of medicinal or operative treatment can often be gauged by tonometry with accuracy and impartiality.

Perimetry.

In opening this section of the subject, I should like to reaffirm my strong conviction that the perimetric examination of a patient, when suitably conducted, furnishes alike the most delicate and the most reliable indications (1) of the presence of glaucoma, (2) of the progress, if any, that the disease is making, and (3) of the value of *any* method of treatment whether medicinal or operative.

It is important to realize that there are two main elements to be considered: (1) Any limitations or alterations in the field of vision as a whole, and (2) any changes in that part of the field lying within 26° of the centre of vision.

1. *The first of these* can be best dealt with by the aid of the ordinary perimeter, an instrument with which every student is familiar; but certain essentials must be borne in mind: (i) The examination must be made with care, a large number of points being registered; (ii) it must be conducted along concentric circles from the centre to the periphery, and not along radii. I lay stress on this matter because we so often see charts which profess to plot a field on the strength of obviously not more than six or eight observations. Such tracings are of little, if any, value. (iii) Small test-object must be used.

Quite early in the course of glaucoma the field is found to be shrunken, and there are certain features of this shrinking which, if not characteristic, are at least highly suggestive: (i) It is the *nasal* portion of the field which suffers first, and which in most cases suffers most up to the very end; (ii) the peculiar phenomenon known as *Roenne's step* can be demonstrated in a very large percentage of the cases if the rules laid down above are strictly obeyed. We have not time to linger over this sign at present, but shall hope to demonstrate it to any of you who are sufficiently interested this afternoon. The essential feature of it is that one half of the field, either the upper or the lower, is curtailed to a greater degree

than the other, thus giving the appearance of a step in the chart (Fig. 2).

2. *The changes in that part of the field lying within twenty-six degrees of the centre of vision* are best conducted by the aid of special perimeters which are worked at a considerably greater distance (1 to 2 m.) than the ordinary instruments, and with much smaller objects (1 to 2 mm. in diameter) than those usually employed. By these means we get a more accurate delineation of scotomata, and we make the patient's task much easier, owing to the magnification thus given to the defects. We shall speak briefly of certain important phenomena found by these methods in glaucomatous fields.

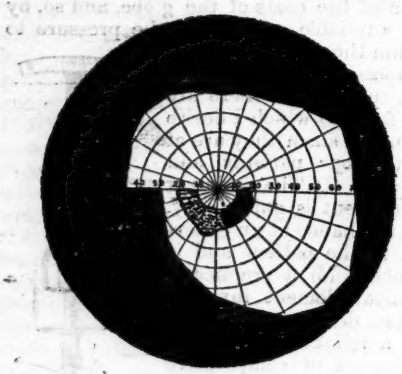

FIG. 2 — Visual field (R.E.), showing Roenne's step and Bjerrum's sign.

(*a*) *Bjerrum's Sign.*—This is a peculiar scotoma, which starts from the blind spot, sweeps round the central area of fixation, either above or below it, or both if double, and ends on a horizontal raphé on the nasal side of the field. It has been described as being bow-shaped, sickle-shaped, comma-shaped, comet-like, and so on; it really has a shape of its own, which once seen is easily appreciated. The lesion of which this sign is evidence is believed to be situate at the margin of the papilla, and to be an indication of the injury inflicted by the sharp edge of the disc on certain bundles of nerve fibres as they cross over (Fig. 2).

(*b*) *Seidel's sign* is merely a very early stage of Bjerrum's sign, and consists, according to Seidel, in an elongation, either upward or downward, or both, of the blind spot. These elongations terminate in pointed ends; a somewhat crescentic figure is formed with its concavity toward the centre of fixation of the field. Seidel laid stress on the fact that his sign could be detected at a very early stage indeed, and even before any other evidence of glaucoma could possibly be elicited (Fig. 3).

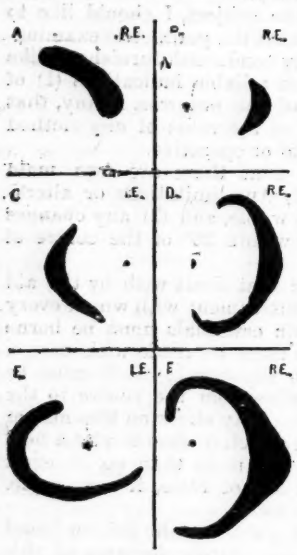

FIG. 3.—Seidel's sign.

(*c*) It was whilst endeavouring to test Seidel's work that I hit upon what I think I may venture to call *a third* and very important *sign of glaucoma*. I argued that if the scotoma was really a sign of injury to nerve bundles, it should, when sufficiently carefully mapped out, manifest itself, not as a pointed crescent, but like the outspread hairs of a paint-brush, some of the hairs—to carry on the simile—extending further than others. My reason for this was that if it is a question of nerve bundles being injured, and if only certain of them are injured, it would seem probable that there would be a differentiation in the amount of injury between the damaged bundles, or even between the fibres of any individual bundle. To test this point I adopted (i) Priestley Smith's circular method of examination; (ii) Bjerrum's principle of small test objects used at long distances from the eye; and (iii) with these I incorporated an idea of my own—namely, the examination of the field at degree intervals from 0° out to 30°. The results justified my expectations, and showed that, at a very early stage of glaucoma, the blind spot not merely shows an enlargement whose general tendency is to run concentric with the circles of the visual field, but which also ends in both directions in jagged points, just as I had anticipated (Fig. 4). This test enables anyone who will use it carefully (1) to detect glaucoma before any other evidence of it is in existence; (2) to watch with great accuracy the course of the disease, detecting any progress that may be made, or establishing the fact that the pathologic process is stationary; (3) to determine the value of any methods of treatment, operative or otherwise, which may be employed; and (4) to explain improvements in or deteriorations of vision as experienced by the patient, in the absence of any detectable changes in central visual acuity or in the peripheral limits of the visual field. The examination can be conducted easily, quickly, and accurately after a very little experience with the scotometer which I have devised for the purpose (Fig. 5).

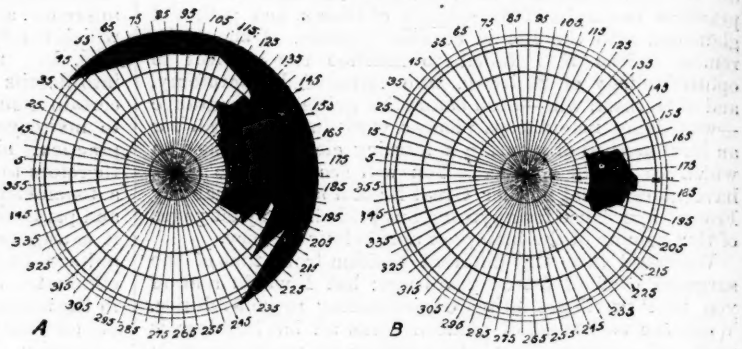

FIG. 4.—The author's sign of glaucoma. A, Before operation. B, Shortly after operation.

Examination of the Light Sense.

This is a subject on which we must necessarily be brief, since it has not yet come fully into its own; but the time is not far distant when it will be better understood and correspondingly more highly valued. We know that one of the most bitter complaints of the late glaucoma patient is the difficulty he finds in adapting himself to any changes in the surrounding light, and the limitations to which he is subjected when the daylight fails or when the source of artificial illumination is poor. There is good reason to believe that a slight failure in light sense is one of the earliest indications of the onset of glaucoma. We are still looking for an ideal instrument for testing this sense, one which will be quick and easy to use and will, at the same time, be reliable in its indications. Young's revolving cards, which I shall hope to have the opportunity of showing you this afternoon, appear to fulfil the necessary indications; but they are so new to us that it is difficult to speak with certainty.

Measurement of the Diameter of the Cornea.

Priestley Smith has shown that those who have a relatively small cornea are likely to present other anatomical peculiarities, which predispose to an obstruction to the outflow from the angle of the chamber, and so favour the onset of glaucoma. It is therefore most desirable that we should be able to measure one at least of the diameters of the cornea with accuracy. I know of no method of doing this, though I have tried all that have been advertised or recommended, inclusive of the German models. I have for some time past been endeavouring to have a suitable instrument constructed; the main difficulty has lain in the present state of industry. In addition to this, few English makers care to take up the manufacture of an expensive instrument in view of the fact that its cost alone condemns it amongst our own surgeons. I hope soon, however, to overcome all the difficulties, and to have a suitable instrument placed on the market for those to use it who will.

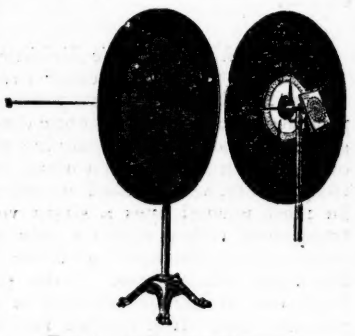

FIG. 5.—Author's scotometer.

My object has been to employ the limited time at my disposal to indicate the advances that have been made and that are in process of being made, and to show that we now have it in our power (1) to detect glaucoma in its very earliest stages, (2) to watch its course with accuracy and confidence, and (3) to check the results which we attain by any of those methods of treatment which we may think right to adopt.

I would ask permission to make a few final remarks of a practical nature which arise out of what has gone before. Circumstances demand that I should be brief, and therefore I must be dogmatic.

1. In the observation of a case of glaucoma we must take account of the evidence obtained from scotometry, perimetry, tonometry, ophthalmoscopic appearances, and other physical signs, and from diminution in the visual acuity. I want you to observe carefully the above order, which is deliberate and intentional. A diagnosis should never be made on the strength of one feature of the case alone if any shadow of doubt exists in the surgeon's mind.

2. If we have clear evidence that the disease is progressing, and that progress is due to an increase in tension, it is our duty unhesitatingly to recommend an operation for the production of a filtering cicatrix, and to urge that this be undertaken at the earliest possible moment. If there is one point on which all the greatest authorities, from von Graefe onward, are agreed, it is that the earlier the operation is undertaken the better is the prospect of success. Not only will more sight be saved thereby, but the procedure itself is easier for the surgeon and safer and more certain for the patient.

3. It is idle to pretend that any operation for so serious a condition as glaucoma is devoid of anxiety, and both sides of the question should be set squarely before the patient. As already stated, the risks of failure increase progressively in proportion to the delay, but against this is ever to be placed the fact that progressive glaucoma is a relentless disease, which ends in the majority of cases in total blindness. Even when central vision is lost at the time of operation—an ever-present danger in late cases—peripheral vision is often retained indefinitely, to the great advantage of the patient.

I think I have said enough to convince you that the recent progress, both in diagnosis and in treatment, has added very gravely to the responsibilities of all who meet with glaucoma at an early stage. Given care and courage, the management of a case of the disease, if diagnosed at an early stage, should very, very seldom end in disaster.

DISCUSSION.

Dr. WALLACE HENRY (Leicester) desired to lay some stress on the great assistance in the differential diagnosis of glaucoma in its earliest stages to be obtained from a careful study of the light minimum perceptive power. Dr. Henry mentioned incidentally that when he began the study of light perception, twenty-five years ago, he could find no assistance from previous work of English ophthalmologists, and had to turn to Izard, Chibert, Forster, and Samelsohn in order to get any information on the subject. Its study should be carried on not merely as a matter of scientific interest but because of its practical clinical value. This was especially the case in such diseases as glaucoma, atrophy of the optic nerve, and toxic amblyopia. From his own experiments with a photometer, described twenty-four years ago in the *Ophthalmic Review*, he could confirm Samelsohn's statement that in the earliest stages of glaucoma there was a rapid reduction in the light minimum sense, but very slight reduction in light difference sense. The reverse was the case in incipient atrophy. There was a reduction, but to a small degree in light minimum, but a considerable degree in light difference. In toxic amblyopia there was no reduction in light minimum sense.

Mr. GEORGE WHERRY (Cambridge) said that progress in surgery, and especially in ophthalmic surgery, had followed always the introduction or perfecting of some instrument, beginning with the Helmholtz ophthalmoscope, and now, for the early diagnosis of glaucoma, the tonometer and perimeter, and other such aids. Unless a fairly early diagnosis was made, no cure could be hoped for. The optic nerve in glaucoma became atrophied, and hopeless blindness followed if the disease progressed and no operation was done. A permanent cure could only be expected by operation. There were relief remedies such as eserine and other myotics, and in this regard Mr. Wherry asked for an opinion from Colonel Elliot as to Martin Fisher's work with animals' eyes in which artificial glaucoma was produced by soaking the eyes in acidulated water, the tension being afterwards lowered to normal by the subconjunctival injection of a sodium citrate solution. Mr. Wherry had the greatest respect for the magnificent work of Priestley Smith both on the normal structure and growth of the eye and on glaucoma.

Dr. ANTILL POCKLEY (Sydney, N.S.W.) said that while he hesitated to confess to a difference of practice from Colonel Elliot, who was so great an authority on glaucoma, and who had so modestly refrained from referring to his own great work, he yet thought it well to raise a point with regard to the tonometer. Colonel Elliot had said that he had never seen any harm result, but Dr. Pockley said that he had seen accidents to the cornea from the instrument. No doubt these accidents were due to its careless use without proper aseptic precautions. But the possibility of carelessness must be reckoned with, and an unnecessary element of danger should not be introduced. He said unnecessary because in his opinion the state of the tension was the least important factor in determining the line of treatment in chronic glaucoma. The repeated careful methodical examination of the field, combined with what information could be got from the *tactus eruditus* of the finger tips was for all practical purposes sufficient to determine the line of treatment.

Lieut.-Colonel ELLIOT, in reply to Dr. Wallace Henry, said that an instrument for testing the "light minimum" and the "light difference" was a great desideratum. It must be of such a nature as to be capable of being used quickly and easily for clinical purposes. At present no such instrument existed. If Dr. Wallace Henry would continue his investigations in that direction and would provide such an instrument he would render a great service to ophthalmology. In reply to Mr. Wherry, Colonel Elliot said that Fisher's work had brought no real help to the eye surgeon. The strength of acid solution required to produce the changes which Fisher described was far in excess of anything that would be met with under clinical conditions. Nor had the treatment by the injection of citrate solutions proved of any practical value; the results had been disappointing in the extreme, whilst definite harm had been done by the adhesions excited by such injections; these adhesions, when they were met with, made the later treatment by filtering operations difficult or impossible. In reply to Dr. Pockley, he said that it was true that there was an element of risk in the use of tonometry on old eyes if ordinary precautions were not taken. A very small quantity of liquid paraffin used to moisten the piston of the footplate of the tonometer was a great protection to the corneal epithelium. To turn old people out into the dust of the street after a prolonged tonometry was to take an unnecessary risk. They should be kept in a home or in a hospital or under other suitable observation for twenty-four hours, and should have a 12½ per cent. solution of argyrol instilled at three-hour intervals. It would be quite impossible to say that a surgeon had performed a glaucoma operation unnecessarily or by mistake. He was the more thankful for this because, if it were not so, a surgeon might find himself placed in a very difficult predicament. It was to be remembered that undoubted cupping of the optic disc might totally disappear after the relief of tension by operative measures. This statement did not rest on his own experiences alone, but on that also of several other widely known surgeons. Again, the association of cataract with glaucoma, both after and independent of operations for the relief of the condition, was widely known. It would therefore be most unjust to blame a surgeon because of lens opacities met with after a glaucoma operation.

A DEMONSTRATION ON BLOOD TRANSFUSION.

BY

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AND

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[THE following is an account of a demonstration given by request. The method described will be familiar to the majority of those who used it or witnessed its use in the Army abroad, but it is believed that it will be of considerable interest to others who had not that advantage.]

The Choice of Donors for Blood Transfusion.

It is important that no one should be used as a donor who has suffered from any disease communicable by the blood—syphilis, malaria, trench fever, etc.

There exist in the plasma of man bodies which will agglutinate, and often subsequently haemolyze, the red

blood corpuscles of certain other individuals. Transfusion of such incompatible bloods is likely to be fatal to the recipient, haemoglobinuria and severe jaundice resulting from agglutination and haemolysis of the unsuitable corpuscles introduced.

It has been shown by Moss that all individuals fall into four groups as regards these agglutinative and haemolytic properties of their blood serum and plasma.

Table showing the Classification of Moss into the Four "Groups," and the Percentage of Individuals belonging to each Group.

Serum of Group.	Red Cells of Group.				No. of Individuals in Each Group.
	I.	II.	III.	IV.	
I	0	0	0	0	I ... 5%
II	+	0	+	0	II ... 40%
III	+	+	0	0	III ... 10%
IV	+	+	+	0	IV ... 45%

+ = Agglutination. 0 = No agglutination.

Transfusion can be made safe by testing the effect of the recipient's serum on the prospective donor's red blood corpuscles. Such a test is impracticable in cases of urgency, owing to the time required to carry it out.

A simpler method, and the one now almost universally employed, is to test the "group" of both donor and recipient. This can be done in a minute or two, and a glance at the table shows at once whether the blood of the donor will be suitable.

It is not necessary for the donor to belong to the same group as the recipient. The one essential practical consideration is that the recipient's serum should not agglutinate the red cells of the donor. (The plasma necessarily injected along with the donor's red corpuscles is so diluted at once in the circulation that in practice it has no action whatever on the red corpuscles of the recipient.)

It will be seen from the table that the red cells of Group IV are agglutinated by no other group.

Group IV individuals are "*universal donors*," and their blood can safely be transfused into any recipient.

Group I individuals do not agglutinate with their serum the red cells of any other group. Group I individuals are "universal recipients," and can take blood safely from any donor.

Group II and *Group III* individuals can only receive blood from their own group or from "universal donors" (Group IV).

The Test in Practice.

Looking at the table, it will be seen that to recognize all the groups it is only necessary to keep in hand a stock of serum of Groups II and III. The only other apparatus required are glass microscope slides, and a needle for obtaining the drop of blood from the finger or ear.

A drop of each of these serums is placed on a glass slide, and a small drop of blood from the individual to be tested is mixed separately with each serum. Agglutination, if it occurs, does so within a minute or two, if the test serums are active, and is aided by gently rocking the slide. If agglutination occurs, the drop of blood runs into small masses resembling brick-dust. The change is perfectly obvious to the naked eye, and no microscope is required.

Using Groups II and III serums in this way, it is obvious from the table, that if

Both serums agglutinate, the individual belongs to *Group I.*

Neither serum agglutinates, the individual belongs to *Group IV* (universal donor).

Group II serum agglutinates, the individual belongs to *Group III.*

Group III serum agglutinates, the individual belongs to *Group II.*

Method I.

A Kimpton's tube is sterilized in the autoclave and coated inside with saturated solution of paraffin (M.P.54° C.) in ether. The donor and recipient lie on adjacent tables with arm boards. To each a light tourniquet of tape is applied near the shoulder.

The *recipient's* vein is exposed under novocain for 1½ in., cleared, and kept empty of blood by placing an expanded pair of dissecting forceps beneath it. A ligature is attached to the distal part of the exposed vein. The tourniquet is removed, and a V-shaped incision made with its opening towards the shoulder. Mosquito Spencer Wells forceps are attached to the vein and covered with a saline swab.

The *donor's* vein is exposed in the same manner by a V-shaped incision towards the hand, and without the removal of the tourniquet. A ligature is attached to the proximal end of the exposed vein. The cannula of the Kimpton's tube is placed in the vein pointing peripherally and the forceps relaxed; it is kept there by pulling on the ligature. The flow of blood is aided by grasping movements of the donor's hand and suction from Ingram's bulb applied to the air tube by an assistant. The amount of blood obtained is 400 to 500 c.cm. The cannula is withdrawn, allowing the forceps to expand and empty the vein. The operator's finger is applied to the cannula, which is now inserted into the recipient's vein pointing centrally. The flow of blood is aided by positive pressure from Ingram's bulb. Transfusion is stopped before the blood reaches the cannula. The tube is discarded into saline, and a fresh tube taken for the second part. The amount transfused is usually from 800 to 1000 c.cm. Both veins are tied off, the used portion excised, and the wounds closed.

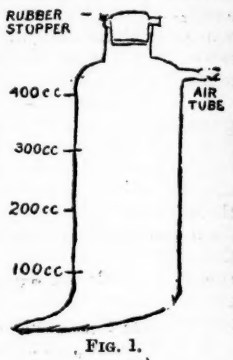


FIG. 1.

The drawbacks to this method are clotting and waste of blood if the flow is delayed, and that exposure of the vein is necessary.

Method II.

Citrated blood by Robertson's bottle. There is placed in the bottle 100 c.cm. of 3.8 per cent. citrate solution, and the whole apparatus is sterilized in the autoclave, the two needles being protected by plugging into test tubes half full of liquid paraffin. The outlet tube closed by the stopcock.

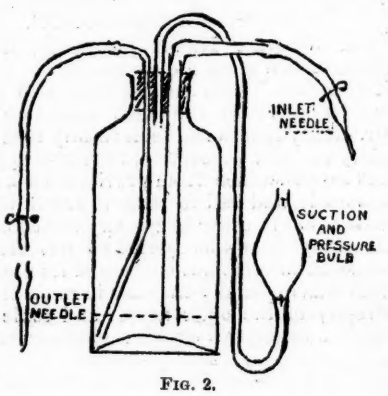


FIG. 2.

A light tourniquet is applied to the donor's arm to 50 mm. Hg pressure, the vein well filled by movements, the skin cleansed, and novocain 1 per cent. injected into the skin. Pressure is made with the pump to fill the inlet tube with citrate solution and drive air out of the needle.

The stopcock on the inlet tube is closed, and the pump reversed ready for suction. Slight suction is made in the bottle, and a small nick is made over the vein with the point of the scalpel, the needle is inserted under the skin, the inlet stopcock opened, and the needle pushed into the vein. Moderate suction is maintained, and the bottle rocked with rotary movement, the donor keeping up grasping movements; 700 c.cm. can thus be obtained. If clotting occurs a fresh start must be made. When 700 c.cm. has been obtained the tourniquet is removed, the stopcock closed, and the needle removed. The bottle is next placed in a glass jar containing water at body temperature, and care is taken to see that the rubber cork is tight, to prevent its being forced out by pressure.

The recipient's arm is prepared as the donor's was, and then pressure is produced inside the bottle by the pump, the outlet stopcock opened to fill the tube with citrated blood and then closed again. The tourniquet is tightened and the needle placed in the vein when the glass connexion will fill with blood. Directly this occurs the tourniquet is released, the tube connected, and transfusion begins. At

the end the stopcock is closed before air bubbles reach the needle.

It may be necessary to expose one or both veins, and use a cannula.

Sodium citrate solution (3.8 per cent.) is prepared by adding 6 grams of citrate to 160 c.cm. of water.

SECTION OF PHYSIOLOGY AND PHARMACOLOGY.

Professor F. GOWLAND HOPKINS, F.R.S., D.Sc., F.R.C.P., President.

DISCUSSION ON QUININE AND ITS RELATED ALKALOIDS IN PHARMACOLOGY AND THERAPEUTICS.

OPENING PAPERS.

Professor W. E. DIXON, M.D., F.R.S.,
Pharmacological Laboratory, Cambridge.

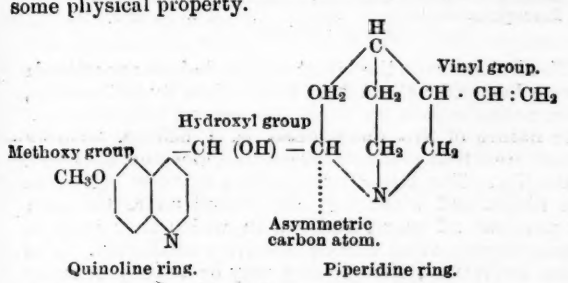
DURING the five years of war the disease which caused the greatest loss of effective man-power was malaria. In the months of October, November, and December, 1919, the various pension boards throughout the United Kingdom found that one of every thirteen cases they examined was due to the ravages of this disease; so that not only did malaria add considerably to our casualty lists during the war, but the nation is still suffering from its effects by sickness and loss of money. The greatest mortality and sickness occurred throughout the campaign in Salonica and East Africa, and during the advance in Palestine in 1918. Quinine and its derivatives have assumed, therefore, a significance perhaps never before appreciated to the full.

Quinine is peculiar among alkaloids in that it has no very definite specific action on any particular tissue in the body. Its action on all living tissues is to cause diminished activity and diminished metabolic changes. Sometimes there is a transient increase of activity before the depression is evident.

Chemistry.

Quinine has a complicated molecule which is illustrated graphically in order that I may refer to its derivatives. It is formed from the combination of a quinoline ring with a piperidine ring.

With our present knowledge no benefit can be derived from endeavouring to determine how this complex molecule produces its action. It cannot be stated with certainty whether the effect is due to mass action, whether the side chains combine with constituents of the living cell or even whether the whole action may not be the result of some physical property.



Constitutional Formula of Quinine.

Quinine derivatives are formed by alterations in the methoxy, the hydroxyl, or the vinyl group. The asymmetric carbon atom allows of isomeric modifications.

Cinchonine differs from quinine only in the absence of the methoxy group (O CH_3). If this methoxy group is replaced by the OH radicle we get cupreine. Many derivatives have been prepared by replacing the H of the OH group with another group, so as to form an insoluble quinine ether; these ethers are split up by the alkali of the duodenum into quinine compounds, and are exactly analogous in their relation to quinine as aspirin is to salicylic acid. Such quinine derivations are aristoquinine (diquinine-ester of carbonic acid), euquinine (ethyl carbonate), and many others. Their insolubility makes them tasteless, but they have no other advantage over quinine. Hydroquinine, from which most of the newer and more valuable derivatives are formed, has the vinyl group $CH=CH_2$ converted into CH_2-CH_3. Ethyl hydrocupreine is hydroquinine in which the methoxy group OCH_3 is changed to ethoxy $O.C_2H_5$, and by substituting the higher homologues we can obtain the iso propyl, iso-amyl, and iso-octyl hydrocupreines.

The pharmacological action of derivatives from each of the rings composing quinine is full of interest. Thus, from the piperidine ring we are in close relation to nicotine, and from the quinoline ring we have many antiseptic substances, and more recently the interesting substance phenyl quinoline-carbonic acid, which, with its allies, is unique among drugs, in that it renders the kidney easily permeable to uric acid and urates, without influencing metabolism, so that more uric acid is present in the urine and less in the blood. This remarkable action is analogous to the effect of phloridzin, which renders the kidney permeable to sugar.

Protozoa.

The most characteristic action of the quinine alkaloids is their effect on undifferentiated protoplasm. All kinds of ciliary movements are rendered slower and ultimately cease; spermatozoa and ova are destroyed by small percentages; paramoecia and amoebae in such amounts as 1 in 30,000 are killed in a few hours, though the amoebae of salt water are not injured by much stronger amounts. The spirochaetes of vegetable decomposition become motionless in the presence of quinine in strengths of 1 in 10,000, but those of relapsing fever are not influenced even by such strengths as 1 in 500. Similar concentrations of quinine in the blood act on the white blood cells in the same way as in the case of pond amoebae: movements cease, and the corpuscle becomes granular. Quinine, then, should have the power to limit inflammatory processes, for it prevents the migration of white blood cells, and it is possible that the internal administration of large doses of quinine may limit pus formation. Symptoms, however, are not conditions to be lightly stopped. He who stops a useful cough with morphine may drown the patient in his own expectoration. Washed tetanus spores given hypodermically to guinea-pigs or monkeys do not produce tetanus; if quinine is injected into the animals the day before or the day after the spores are injected, then tetanus is contracted (Semple). Other alkaloids like morphine have not this action.

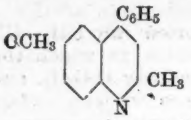
We are not in a position to explain why certain protozoa are unaffected by quinine; but as quinine has the same type of action on all living protoplasm, it may be assumed that in these instances for some unknown reason the alkaloid does not reach the organism.

Table showing some of the Results obtained by Different Workers on Paramoecia.

Drug.	Lethal Strength.				
	1 in 1,000.	1 in 5,000.	1 in 10,000.	1 in 25,000.	1 in 200,000.
Quinine sulphate ...	2 min.	13 min.	40 min.		
Quinine hydrochloride	2 min.	10 min.	30 min.		
Cinchonine hydrochloride	10 min.				
Cinchonidine hydrochloride	9 min.				
Ethyl hydrocupreine sulphate	1 min.	6 min.	20 min.	1½ hrs.	
Iso-propyl hydrocupreine sulphate	immed.	immed.	12 min.	60 min.	
Iso-amyl hydrocupreine sulphate	immed.	immed.	8 min.	30 min.	
Phenyl p. methoxy chinaldine	immed.	2 min.	4 min.	15 min.	
Methyl phosphine ...	—	—	1 min.	7 min.	1¼-1½ hrs.

Too much reliance should not be placed on these figures, as paramoecia lose their resistance by keeping, and I have frequently noticed that paramoecia which have been in a hay infusion some weeks are destroyed by concentrations of quinine salts, which were without effect on them when they first appeared in the infusion. Isolated observations on paramoecia are valueless, and all observations

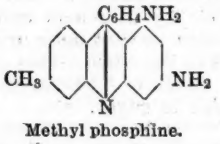
with new drugs should be standardized against one of the quinine salts. Phenyl para-methoxy chinaldine is the



Phenyl p.-methoxy quinaldine.

most active of the quinoline derivatives as a protozoal poison, and is included in the table for that reason. Methyl phosphine is the most active paramoecial poison known. It is an acridine derivative, and its relation to acridine will be seen from a comparison of the two formulae.

Acridine.



Methyl phosphine.

Acridine and its derivatives have a remarkable effect in destroying micro-organisms, but in the light only; this point is illustrated by the following experiment from Jodlbauer and v. Tappeiner. The experiment was made on paramoecia on a very bright day.

Action of Acridine on Paramoecia.

Strength of Drug.	In the Light.	In the Dark.
1 in 2 millions	Death in 3 hours	Living after 48 hours in a strength of 1 in 30,000.
1 in 5 ,,	,, in 4 hours	
1 in 10 ,,	,, in 9 hours	

Such experiments need not detain us, for however interesting they may be in helping to obtain an explanation of how these drugs kill protozoa they are at present of academical interest only, although more is likely to be heard of them in the future.

Unfortunately during the war quinine derivatives could not be obtained easily in England, and so till now there has been little opportunity of testing their value in malaria. Ethyl-hydrocupreine is perhaps the only one with which any considerable number of tests have been made, and Izar and Nicosia, Liefmann, and others state that it will cure cases which are resistant to quinine. Experiments have, however, been made with the natural alkaloids from cinchona bark other than quinine and with hydroquinine, and we shall no doubt hear something about these to-day.

Quinine has never had much vogue in the treatment of syphilis in this country, though it has been used considerably in France. The new derivatives of quinine offer a large field for experiments not only in syphilis but in diseases caused by trypanosomes. It would be out of place for me to refer to the treatment of malaria by quinine except to solicit information. It is generally taught that quinine penetrates the red blood cell with difficulty, and that so long as the parasite is hidden within the corpuscle quinine exerts little or no destructive action.

There is, I believe, serious doubt as to the validity of this hypothesis, and I hope for some enlightenment from those who have had the opportunity for making observations.

Ferments.

Quinine retards all vital processes, both building up and breaking down; it spares tissue waste in small amounts and stops all production of energy in large. Some tissues it is true show an apparent transient stimulation under the influence of small doses of quinine, such, for example, as striped muscle. But here there is a sudden liberation of lactic acid and other substances due to the direct poisonous action of the quinine on muscle. In large doses the effect is strictly comparable with the changes in rigor mortis, but in small doses these breakdown products may afford more assimilable material and increase temporarily the work of the muscle.

Table showing the Effect of Small Amounts of Quinine on some Typical Ferments.

Ferment.	Percentage of Quinine.				
	0.005%	0.05 %	0.5 %	1 %	2 %
Autolytic ferment of liver—					
Rabbit	−	−	−	−	
Dog	+	+	−		
Pepsin	+	+	+	0	−
Lipase (dog's stomach) ...	−	−	−		
Oxydase	+	−	−		
Invertin (yeast)	−	−	−		
Diastase (pancreas)	+	+			

In this table + means increased action; − means diminished action.

Attempts have been made to explain the action of quinine by its effect on unorganized ferments, and it will be noticed by a reference to the table that certain of the ferments of which we have some knowledge act better in the presence of small amounts though their action is retarded by large amounts of quinine. Traces of quinine in blood inhibit acid formation. The synthesis of hippuric and salicyluric acids by the surviving kidney is stopped by minute amounts of quinine.

The action of quinine is not therefore confined to intact protoplasm but extends to the ferments.

Local Anaesthesia.

General protoplasmic poisons like carbolic and hydrocyanic acids usually produce local anaesthesia when applied to a mucous membrane or injected subcutaneously, and sometimes this action serves as an indication for their toxicity on tissue cells. Quinine has been used as a local anaesthetic combined with urea, which increases its solubility and enables it the better to penetrate tissues, but the new compound is weaker, and must be used in twice the strength which would be required for quinine. The quinine derivatives differ from cocaine and its allies in that they are more destructive to tissues other than nerve —that is, they are less specific for nerve.

The necessary strengths of the quinine derivatives to produce local anaesthesia of the rabbit's cornea have been estimated as follows:

Strengths of Quinine Derivatives Producing Corneal Anaesthesia.

Quinine HCl	1 in 60
Cocaine HCl	1 in 50
Hydroquinine HCl	1 in 100
Ethyl hydrocupreine HCl	1 in 100
Isopropylhydrocupreine HCl	1 in 800
Isobutylhydrocupreine HCl	1 in 1,000
Isoamylhydrocupreine HCl	1 in 1,200
Eucuprinotoxine	1 in 2,000
(Isomeric with the last)	

With all these salts the latent period before anaesthesia occurs is longer, by about four times, than that of cocaine, but the anaesthesia is prolonged, lasting one hour or more.

The nature of this anaesthesia is, I believe, entirely different from that produced by cocaine, stovaine, novocain, and the like. The latter drugs exert a selective action on nerve fibrils, and when they are placed under the skin they paralyse all nerve fibrils with which they come in contact, leaving other tissues relatively unaffected. The quinine derivatives, though they may be twenty or more times as powerful as quinine on the rabbit's cornea, have little or no selective action for nerve fibrils. When placed under the skin in concentrations which will not paralyse sensory nerve fibrils they nevertheless produce anaesthesia. This clearly suggests that they may affect the sensory nerve endings, and experiments are now in progress with a view to determining the nature of the anaesthesia.

Morgenroth and Ginsberg state that anaesthesia of the rabbit's cornea can be produced by isopropyl- and isoamyl-hydrocupreine in concentrations twenty to twenty-five times less than that required for cocaine. Thus a few drops of 0.08 to 0.1 per cent. of isoamylhydrocupreine produces an anaesthesia lasting from sixty to ninety minutes. An isomeric derivative of isoamylhydrocupreine which

Morgenroth has termed eucuprinotoxine is stated by him to be the most powerful local anaesthetic known, being forty to fifty times more potent than cocaine. Regarding their effects on the human eye we have not much information available, but I have convinced myself that these alkaloids are more irritant than cocaine; even a 0.2 per cent. solution of ethylhydrocupreine, which is not strong enough to cause anaesthesia, induces some irritation.

What is required in medicine is not a superquinine but a quinine with more specialized selective actions on certain organisms. Isoamylhydrocupreine is from ten to twenty times more powerful than quinine (1) in destruction of protozoa, (2) as a germicide, (3) as a local anaesthetic. It is, however, not ten times more poisonous than quinine, as 25 grains may be administered in the twenty-four hours without ill effect. So that it is clearly a step in the right direction. Whatever future these alkaloids may have in medicine it seems improbable, in view of their lack of specificity for nerve fibres, that they will have much vogue as local anaesthetics.

Metabolism.

Since quinine depresses all living tissues in much the same way its effect should clearly be discernible in metabolism. Our facts in this respect are not uncertain, though it is not simple to understand their interpretation. Under the influence of quinine and its derivatives general metabolism is lowered, as shown by the diminution in the excretion of urea, sulphates, phosphates, and chlorides in the urine. The diminution of the urinary metabolites is of such a nature as to leave us no option in concluding that there is a diminished protein breakdown, and we might from this with some confidence prophesy that there would be a simultaneous diminution in the absorption of oxygen and in carbon dioxide output. Such, however, is not the case; the gaseous metabolism is hardly influenced. Furthermore, in febrile conditions the temperature is brought down although the heat loss is not increased; that is to say, there may be other important sources of heat in the body besides the oxidation of carbon compounds. These facts are true in health and fever. Quinine therefore prevents excessive protein breakdown and is legitimately used in wasting diseases for this action. It is unlike arsenic and many other drugs in that it does not diminish oxidation, so that no danger arises from increased production of acid, lactic, butyric, etc., from the incomplete oxidation of carbon compounds. I shall make no attempt to explain these facts, as there are other and more interesting points for discussion.

Bacteria.

Until recent years almost the only assured remedies against poisoning by bacteria have been the antitoxins. In general bacterial infections antiseptic drugs so far described destroy the body tissues before they destroy the micro-organisms. The newer quinine derivatives offer a new field for investigation. Some of them exert specific actions in a remarkable degree towards micro-organisms. It sometimes happens that a small change in the vinyl side-chain of the quinine molecule produces a profound difference in its effect on certain bacteria. The reason for this is unknown; it may be due to a very delicate chemical reaction or to some change in physical property which enables the alkaloid to penetrate the bacterium more easily; but the relationship between chemical constitution and pharmacological action is no nearer solution than it appeared to be thirty or forty years ago. Below is a table, modified from Rohde, showing the relative bactericidal action of the quinine derivatives on some micro-organisms.

Relative Bactericidal Action of Quinine Derivatives.

	Diphtheria Bacillus.	Tetanus Bacillus.	Streptococcus.	Staphylococcus.	Pneumococcus.
Quinine hydrochloride	1 : 100	1 : 1,000	1 : 1,000	1 : 500	1 : 2,000
Ethyl hydrocupreine hydrochloride	1 : 400	1 : 2,500	—	1 : 500	1 : 400,000
Isopropylhydrocupreine hydrochloride	1 : 800	—	1 : 8,000	1 : 1,000	1 : 200,000
Isoamylhydrocupreine hydrochloride	1 : 2,000	1 : 20,000	1 : 40,000	1 : 8,000	1 : 20,000
Heptylhydrocupreine bihydrochloride	1 : 8,000	—	—	1 : 64,000	—
Iso-octylhydrocupreine	1 : 8,000	1 : 60,000	1 : 80,000	1 : 16,000	—
Eucuprinotoxine ...	—	—	1 : 60,000	1 : 52,000	—

Ethyl Hydrocupreine.

It will be seen from this that the only really high degree of specificity so far discovered is that of ethyl hydrocupreine for the pneumococcus. This drug kills the pneumococcus in strengths of 1 in 500,000 or less, but for other bacteria it must be 100 or 1,000 times stronger to produce a comparable effect. By injections into rats, mice, and guinea-pigs this alkaloid can effect a cure of the septicaemia caused by pneumococcus; but when it is used in the treatment of pneumonia in man the evidence as to its specific action and value is, so far, conflicting. There are not lacking many physicians, especially Germans, who extol its virtues for pneumonias of various kinds; some few deprecate its use on account of its toxic action on the eye. There can be no longer any question that this alkaloid kills the pneumococcus in the blood of man when administered in doses that it is perfectly permissible to administer. Results have shown that a bactericidal action for pneumococci is produced in the blood serum of patients if they receive by the mouth an amount of ethyl hydrocupreine hydrochloride corresponding with 0.024 gram per kilogram body weight per twenty-four hours. It is not easy to explain why physicians have not obtained more striking results with a drug which destroys the primary cause of the disease. It is of comparatively little value to administer tetanus antitoxin when the toxin has already poisoned the nerve cells, and I venture to suggest that for a similar reason ethyl hydrocupreine may be of little value when the pneumonic condition is at its height. The pathology of early pneumonia is not well known, but the pneumococcus is apparently plentiful only in the early stages of the attack. The inflammatory process then continues in the ordinary course and may go on, even though all the pneumococci be dead. If this interpretation is correct, ethyl hydrocupreine would be of little value in the treatment of well pronounced cases of pneumonia, but should be of inestimable value in early cases and as a prophylactic. So certain are we of our facts concerning this drug—that we can render the blood of our patients pneumococcicidal—that the gravest reasons only should condemn it to oblivion.

The dose recommended by Morgenroth is 20 to 25 gr. in the twenty-four hours, and this dose Moore and Chesney have shown to be sufficient to render the blood pneumococcicidal.

Unfortunately, treatment by ethyl hydrocupreine is not free from danger. It is well known that quinine in medicinal doses may contract the field of vision and even produce blindness. This effect seems to be more pronounced with the substance under discussion, and although Morgenroth has justifiably criticized some of the physicians who after using the alkaloid described amblyopia, on the ground that they prescribed unnecessarily large doses—Feilchenfeld, for example, administered 60 gr. in twenty-four hours—yet such a writer as L. Schreiber describes optic atrophy after using the drug on a patient, and states that after very careful dosage permanent toxic symptoms may appear. W. Zweig describes how a dose of about 8 gr. caused total amblyopia; in this case gradual improvement occurred, but a grave disturbance of sight remained which induced him to advise against this form of therapy. E. Leschke also draws attention to the disturbance of vision, and recommends the use of smaller doses and the employment of the less soluble derivatives such as the base or salicylic ester. Ethyl hydrocupreine, therefore, though a true specific for the pneumococcus, is not ideal, as in a small proportion of patients the optic nerve and retina may be affected; it is true that this condition is generally transient, as with quinine, yet permanent disturbance of vision sometimes results. The number of physicians—and I have some thirty reports before me—who write favourably of this treatment is large in comparison with those who have no use for it.

Ethyl hydrocupreine has been employed for diagnostic purposes. Pneumococci and mucous streptococci are inhibited by strengths of 1 in 400,000. Ordinary streptococci, meningococci, and gonococci need very much higher concentrations. It is also regarded by Angstein and by Axenfeld and Plocher as a specific for pneumococcal ulcus serpens; the latter writers, on account of the pain which

may occur from its local application, recommend the preliminary use of holocaine.

Other Allied Derivatives.

None of the other allied derivatives of quinine have had such extensive trials as that we have discussed. Perhaps the next most common is iso-octylhydrocupreine: this was reported upon favourably by certain Germans who employed it in the treatment of war wounds. Thus E. Bebergeil obtained most satisfactory results in suppuration cases. R. Klapp incised septic wounds and treated with the iso-octyl at considerable depth. He used 0.1 gram in a litre of physiological saline with the happiest results. These observations were confirmed by Otto Ansinn, and several other Germans speak well of it in combating inflammatory conditions.

Isoamylhydrocupriene was employed by J. Tugendreich in numerous cases of carcinoma of the mamma. He states that the pains diminished, ulceration frequently healing rapidly; the drug was used as the free base dissolved in oil. Michaelis regards this alkaloid as a specific in Vincent's angina. Isoamyl has not given satisfactory results in influenza and acute rheumatism.

These observations made during the last three years are sufficient to show the possibilities of the quinine derivatives, and we are after all only touching the fringe of this branch of pharmacology.

Absorption and Excretion.

Quinine administered by the mouth as one of its more soluble salts appears to be absorbed in the same way as other alkaloids. It passes for the most part through the stomach unchanged and is absorbed by the duodenum. No reason exists for supposing that it reaches the blood in any form other than quinine. The more soluble salts of quinine are absorbed a little quicker than the more insoluble, and the quinine esters—aristoquinine, euquinine, saloquinine, and the like—are absorbed considerably more slowly, since they require to be hydrolyzed by the alkali of the duodenum; no doubt, as in the case of analogous ethers like salol, some is not hydrolyzed, and passes through the alimentary canal unabsorbed. All observers agree that individuals differ in the rate at which they absorb quinine, but it seems clear that when soluble salts are taken the whole of the quinine is absorbed, since none is found in the faeces.

On reaching the blood quinine distributes itself in the various tissues, and Ramsden states that it accumulates in most tissues at a higher concentration than in the blood. Accumulation is especially marked in the suprarenal, spleen, and kidney. This is not the rule, as most alkaloids, as was shown first by Heger in 1873, and later by many other observers, tend to collect in the liver and are frequently excreted by the bile. Albertoni showed in 1876 that quinine could be detected in the bile of dogs two hours after oral administration. In the blood Baldoni found the greater percentage of quinine in the corpuscles, but Hartman and Zila and also Ramsden and Lipkin found more in the plasma; this is of some importance in view of its action in malaria, and I hope we shall hear more about it. Quinine is then excreted by the kidney unchanged.

All observers again agree that the excretion shows marked individual and daily changes. It may be detected in the urine half an hour after administration, but excretion may not be complete for two days. The whole of the quinine is certainly not excreted by the urine; we shall not, perhaps, be much out if we accept the figure of Nierenstein and state that about half the quinine ultimately finds its way into the urine unchanged; and most other observers give smaller figures. As mere traces only are excreted elsewhere the quinine must either be stored up in the body or destroyed: the latter view is correct; estimation of the total quinine in the body will not account for that which is missing.

It has long been known that the liver destroys morphine, atropine, nicotine, and other alkaloids, and we have reasons for believing that this action is due to a ferment. An emulsion of rabbit's liver gives, after filtration through a Berkefeld filter, a liquid possessing a destructive power against alkaloids; this same emulsion, filtered through a Pasteur-Chamberland filter or heated for thirty minutes at 60° C., has lost this property. Ramsden has performed a similar type of incubation experiment with quinine, and finds that the liver, kidney, and intestinal wall have considerable power to destroy quinine *post mortem*, but that the suprarenal bodies, spleen, bone marrow, etc., have not this property. It will be noticed here that the quinine tends to collect in high concentration in the spleen and suprarenal organs, and that it is just these organs which are unable to destroy it.

It was shown further in my laboratory that nicotine was destroyed the more readily by the liver if the animal had been previously subjected to daily doses of the same alkaloid—that is, tolerance may be explained by enhanced ferment action. In the case of quinine this tolerance does not seem to be so clear, since some authorities state that as much quinine is excreted by those who habitually take the drug as by the novice. Nevertheless, Ramsden states that when quinine is administered in a succession of large doses an abnormally high proportion of that ingested is metabolized.

Lipkin showed that one product of the destruction of quinine by the liver is quitenine, which is identical with quinine except the vinyl group ($CH=CH_2$) is changed to the COOH group. This oxidation renders it relatively harmless, and were the oxidation carried no further would afford the animal some protection, but quitenine appears only as a trace in the urine, and oxidation of the quinine molecule must therefore proceed further.

Methods of Administration.

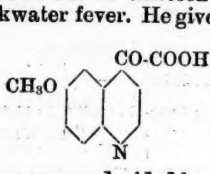
Much has been written of the advantages and disadvantages of the various methods of administering quinine, but I suppose everyone will agree with MacGilchrist that "subcutaneous and intramuscular injections (1 in 1 to 1 in 10) are inferior to quinine by the mouth in rapidity of action and thoroughness of absorption." In strong solution some of the quinine injected is fixed locally and not absorbed. When it is placed in muscle the surrounding fibres enter into rigor mortis, probably on account of the local liberation of lactic acid. Other drugs, like caffeine and potassium iodide, also produce rigor in muscle when injected in concentrated solution. This effect could be avoided by suitably diluting the quinine, in which case Nierenstein shows that no appreciable difference occurs in the excretion of the bihydrochloride whether given by the mouth or by injection into a vein or muscle. Nierenstein also gives the important fact that when more than 11 grains of quinine base per litre of urine are passed, a temporary albuminuria may ensue.

Doctors have been hampered in the past by having the sulphate of quinine thrust upon them; it is easy to prepare and therefore cheap. The two hydrochlorides seem to me to be in every way superior, but others will refer to this in detail.

Blackwater Fever.

Blackwater fever is yet another difficulty associated with quinine therapy. It is a subject on which I have no right to speak, except as to the validity of the evidence dealing with its causation. This evidence shows that the condition is not known in patients who take large doses of quinine for non-protozoal diseases. On the other hand, it does not appear to occur in malaria, at least in its typical form, unless large doses of quinine have been administered. The story of the attack is clear in its suddenness, and points to a sudden liberation into the blood of poison which destroys the corpuscles. Many such poisons are known, but quinine is not one of them. Sulphonal given daily in large doses accumulates in the tissues, and the patient may be free from its ill effects for weeks, but on the sulphonal attaining a certain concentration it suddenly acts and the patient may bleed half the blood in his body into the urine in the course of a few hours.

It has been suggested by Cleland and others that the presence in the serum of a foreign protein from disintegrated merozoites may induce anaphylaxis, but blackwater fever has nothing in common with anaphylaxis as we know it, and search must be made for some other poison. Nierenstein suggests that this substance may be haemoquinic acid, a disintegration product of quinine, which he separated from twelve out of thirteen urines of patients suffering from blackwater fever. He gives it the provisional formula—



—and states that it possesses decided haemolytic properties.

His paper does not prove whether this product is the result or the cause of blackwater, and it is not stated whether its injection into animals causes blackwater.

In these remarks I have endeavoured to state briefly some of the recent observations on the action of quinine and its derivatives. I have not touched on its action on individual organs and tissues because quinine has little specific action in the normal body and depresses all tissues, though especially simple undifferentiated protoplasm. Nor have I attempted to speak of its application in malaria, as there are those here who speak with authority.

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IT will perhaps be useful that I should emphasize briefly some of the more interesting points in the work carried out by Lipkin, Whitley, and myself, and by Lipkin alone.

1. Quinine is very rapidly destroyed by liver pulp. One of the products is quitenine (R. CH : CH_2 → R. COOH). The destructive agent is thermolabile, and acts only in presence of oxygen. Intestine, kidney, and striped muscle also destroy quinine.

2. Quitenine has no curative effect in benign tertian malaria.

3. Quinine is taken up very rapidly by the tissues and is there stored—in most of them at much greater concentration than that found at the same time in the blood. In the suprarenals this concentration may reach an immense figure—for example, 700 times. Maximal figures are, for the kidney, 35, and for the spleen, 24 times that in blood.

4. The concentration of quinine in the red blood corpuscles is about one-third of that in the surrounding serum (presumably also of that in plasma). In view of Morgenroth's contrary finding Dr. Lipkin has recently again estimated the partition-coefficient and has fully confirmed our former statement. He allows me to quote his results.

Defibrinated calf's blood was mixed with the same volumes of 0.85 per cent. salt solutions containing quinine hydrochloride, and, after an interval, centrifugalized.

Milligrams of Quinine per Litre of Blood Mixture.	Concentration of Quinine in Blood Mixture.	Ratio of Concentrations of Quinine in $\frac{\text{Serum}}{\text{Corpuscles}}$.
2.5	1 in 400,000	2.8
5.0	1 in 200,000	3.0
10.0	1 in 100,000	3.2
25 0	1 in 40,000	3.3
50.0	1 in 20,000	3.4
100.0	1 in 10,000	3.4

The partition-ratio found by us in 1911 in guinea-pig's blood from an animal poisoned with quinine at a concentration of 1 in 33,000 was 3.4. Blood from a man during blackwater fever with 1 of quinine in 140,000 parts of blood gave a ratio of 2.2. These ratios are all less than the true figures, since it was impossible to get corpuscles free from serum.

5. The ratio of concentration of quinine $\frac{\text{urine}}{\text{blood}}$ is, during the early stages of excretion, always very high, unless very little quinine has been taken, or there is reason to suspect defective functioning of the kidney. Ratios of 20 to 40 are common, but much higher figures may be reached. In one case it was certainly not less than 375, reckoned for "whole blood," and 250 if reckoned for plasma, probably a "record" instance of the secretory power of the kidney. During blackwater fever it was only 0.94.

6. Although we made a regular practice of testing quinine urines for albumin, the only cases in which it was found were cases of blackwater fever. It has not been our experience that "when more than 11 grains (650 mg.) of quinine base per litre of urine are passed, a temporary albuminuria ensues." Even 3,000 mg. per litre was not accompanied by albuminuria.

7. It is extremely difficult to bring the concentration of quinine in the blood up to 10 mg. per litre. The highest figure we observed was 16.6 mg., and was associated with symptoms of quinine poisoning so grave that we regard that concentration, if maintained for some hours, as not remote from the extreme limit compatible with life. Even that concentration, although in one case maintained during forty-eight hours, failed to effect a radical cure of the patient's benign tertian malaria. It is concluded that failure to cure malaria by quinine is not due to failure to attain, within the limits of the tolerable, sufficient concentration of the drug in the blood.

8. It is an important, and still an open, question whether the malarial parasite is damaged at all by quinine itself in such concentrations as are attainable in the blood, or whether the damage which it suffers during quinine medication is not due to some metabolite of quinine produced only in those tissues (liver, gut, kidney, and muscle) known to destroy quinine—possibly to a fugitive aldehyde R.CHO intermediate between the ingested drug and quitenine. Should this be the case, the chances for some of the parasites to escape destruction would be very greatly multiplied, and the failure of quinine to achieve the "therapeusis magna sterilisans" might find an explanation and possibly even a remedy.

Major H. W. ACTON, I.M.S.

PROGRESS in the prevention and treatment of malaria forms an unfortunate chapter in the history of medicine, advances having been continually hindered by apathetic officials. Malaria is the most important disease in the tropics, and any progress made means a great gain to colonization. The difficulties that beset Sir Ronald Ross when working at the transmission of malaria are known to all. The Mian Mir experiment was considered to prove that antimalarial measures were too costly and not applicable to India. The value of preventive measures was demonstrated to the world during the construction of the Panama Canal, and it was shown that success depends on money and administrative ability. In 1820 Pelletière and Dumas isolated quinine from cinchona bark. Since that date quinine has been regarded as a specific for malaria, to the exclusion of the other alkaloids. Many years ago Cunningham suggested that there might be other alkaloids in cinchona bark as efficacious as quinine. In 1866 a committee was appointed in India to test this, and cinchonine, cinchonidine, and quinidine were tried on 1,200 cases of clinical malaria; the committee found that all three alkaloids exerted an immediate curative effect. No notice was taken of this work, quinine always being considered to be the only specific.

In 1902 Sir David Prain advocated the use of the total alkaloids "cinchona febrifuge," but this was regarded with suspicion as he was in charge of the cinchona plantations, and might be trying to introduce a substance more easily made than quinine. The Dutch were in 1852 the first to cultivate cinchona in Java. These cinchonas were all grown from a packet of seeds collected from one great tree of *Cinchona calisaya* var. *ledgeriana*, growing on the slopes of Chimborazo. The seeds were brought by Ledger, and offered for sale to the India Office, and then to the Indian Government, but were declined by both. The Dutch who bought the seeds at once realized the profitable nature of the industry. Java is now the most important cinchona-growing area in the world, a position largely achieved by long-continued chemical and botanical researches. Nine years later, through the efforts of Sir Clement Markham, *C. officinalis* and *calisaya* chiefly were grown in India, but both barks are inferior to Java bark. An excellent site was secured in Sikkim fulfilling all the conditions necessary for cultivation. A great part of this valuable site has been sold to tea planters, as India always hoped that private enterprise and the Dutch would relieve her of the incubus of growing cinchona. For several years no chemist was employed, and conditions went from bad to worse, so that the Indian bark became very inferior in quality. As the grafts could not be selected from trees with good quinine yields, Sir David Prain after great difficulty managed to obtain an expert quinologist, and the cultivation of cinchonas then rapidly improved. The folly of allowing quinine production to be a monopoly of other nations was only realized in 1916, and attempts are now being made to increase the area of cinchona plantation. The aim of India should be supply cinchona alkaloids to the whole of the British Empire.

The Rate of Multiplication of the Parasite.

Sir Ronald Ross first pointed out that fever in malaria was closely correlated with the number of parasites in the

blood. The diagnosable limits at which parasites can be found in benign tertian infection is about 1 parasite in every 100,000 red blood cells, or 50 parasites per cubic millimetre. This concentration represents a population of about 250,000,000 parasites and is not sufficient to cause fever. This degree of concentration is called a parasitic relapse. In two to four days the parasites attain a sufficient concentration to produce fever—that is, a febrile relapse. The following equation represents the factors concerned in the production of a parasitic relapse, provided the rate of multiplication is not impeded:

$$K = Nr\frac{t}{2}$$

where K = 250,000,000 parasites—that is, sufficiently numerous to diagnose microscopically; N = the number of asexual parasites introduced at the original infection or remaining after treatment; r = rate of multiplication, 24-fold in benign tertian infection, and 12-fold in malignant tertian infection; t = time in days excluding the day of infection, or the last day of treatment. As the multiplication occurs in a forty-eight hour cycle in both infections t is divided by 2.

The rate of multiplication is continuous, and occurs during quinine treatment because (1) the cinchona alkaloids only affect the young forms, for if a dose is given after a paroxysm the next attack of fever is usually not aborted; (2) in the intermittent types of quinine treatment relapses frequently occur between the doses.

TABLE I.—*Showing the Number of Parasitic Relapses that occurred during the Course of the Different Methods of giving Quinine.*

Type of Treatment.	No. of Men Treated.	No. of Relapses during Treatment.
(i) Ross and Thomson's continuous oral treatment of 30 grains daily, followed by 15 grains for ninety days	76	None.
(ii) Intramuscular injections (12) with a continuous oral treatment of two months	36	None.
(iii) Oral continuous, 30 grains daily for three weeks	190	None.
(iv) Oral intermittent (Stephens), 45 grains on two consecutive days weekly for eight weeks	90	14
(v) Oral intermittent (Stephens), 30 grains given as in Series (iv)	113	5
(vi) Intramuscular injections (12) followed by intermittent oral as in Series (v)	58	2

The blood of each patient was examined weekly during treatment, and when parasites were found such cases were recorded as relapses.

That is, there were no relapses during treatment among 302 men undergoing a course of continuous quinine, but among 261 men undergoing an intermittent course there were 21 relapses during treatment. This shows that a continuous treatment is the only sound way to administer these alkaloids, and that multiplication continues in spite of destruction.

(3) Relapses of benign tertian often occur immediately after quinine treatment, indicating that the parasites must be very near febrile limits.

The Production of Cures.

Sterilization, or the destruction of every asexual parasite in the host, is what is meant by the term "cure." Cures may be natural or artificial.

Natural cures are seen more commonly in malignant tertian than in benign tertian fevers, and were it not for this fact, in many parts of the tropics the native population would have been decimated long ago, as few ever get quinine. Natural cures may occur in one of the following ways:

1. The destruction of asexual cycle by the tissues of the body—for example, by phagocytosis, immune substances, etc. We can dismiss this possibility because in spleen smears cells are seen engulfing pigment granules and gametocytes, but never the asexual forms. The malarial parasite is a haemosporidian, and does not leave the red blood cell except to infect another erythrocyte. Antibodies have not been proved.

2. The excessive production of gametocytes. There is abundant evidence in favour of this view. (*a*) Gametocytes are non-multiplying, sexually differentiated forms produced by the multiplication cycle. Gametocytes can only multiply by fertilization in the insect's body and require a lower temperature—18° to 22° C. Schaudinn's view on parthenogenesis is an erroneous conception of the gametocyte function, and has led to an enormous amount of confusion. (*b*) The appearance of gametocytes in the peripheral blood in untreated cases heralds a subsidence of the fever. (*c*) The relative percentage of gametocytes is high in long relapses, and are often the only forms seen in latent malaria.

The immunity of the native is due to the excessive gametocyte formation. A parallel condition is seen in chronic cyst carriers of amoebic dysentery. I may therefore conclude that natural cures are produced by an exhaustion of the asexual cycle owing to excessive gametocyte production; this best explains how the parasite and host can maintain an equilibrium for their mutual benefit. The parasite, by producing a large number of sexual forms, can propagate its species without unduly taxing the host.

Artificial cures are produced by the cinchona alkaloids destroying the young asexual forms, and such cures can be described as occurring in three stages.

1. *The immediate curative effect* as shown by the subsidence of fever and disappearance of parasites from the peripheral blood. The effect is produced by the action of these alkaloids in reducing the parasitic concentration from febrile to afebrile limits—that is, from billions to millions.

TABLE II.—*Showing the Results of the Immediate Curative Effect when Quinine is given Intravenously or Orally in Benign Tertian Infections.*

	Disappearance of Parasites in Hours.						Cases Observed.
	24.	48.	72.	96.	120.	144.	
Intravenous	38	29	5	1	—	—	73
Oral administration (30 grains daily)	—	22	42	31	5	—	100

Unfortunately I was transferred at the most critical stage of my experiments and have not the figures for the effect of cinchona febrifuge and quinidine available, but I found that the parasites disappeared within seventy-two hours after treatment, as compared with 120 hours after quinine. I therefore conclude that in benign tertian infections all the crystalline alkaloids of cinchona exert a marked immediate curative effect. The best results were obtained with cinchonidine and quinidine. As one would expect, quinine acted quicker when given intravenously than when by mouth. My experience in Dagshai on malignant tertian infection was very limited, but the results of the 1866 Commission indicate that these alkaloids act well on clinical malaria.

2. Sterilization or cure is brought about by the complete destruction of the asexual cycle. We know from clinical experience that a few doses of quinine are not sufficient to effect a cure, so that the rate of destruction of each parasitic brood must be under 100 per cent. If we denote this rate of destruction by "f" then—

$$K = N(1-f)\,r\,\frac{t}{2}$$

This equation represents the condition of affairs during treatment, as the rate of destruction probably remains constant. In malignant tertian infections, owing to the slower rate of multiplication—that is, twelve-fold—equilibrium is established when the rate of asexual destruction approaches 92 per cent. of the parasites. If the rate of destruction of each parasitic brood is greater than 92 per cent., a cure results. In benign tertian infections, owing to the rate of multiplication being twenty-four-fold, to attain an equilibrium, a destruction of 95 per cent. of the asexual forms is necessary, and a still higher percentage to effect a cure. The rate of parasitic destruction produced by quinine in benign tertian infections must be about 95 per cent., as a two months' course cures 25 per cent. of the cases, and a four months' course 50 per cent. The destruction rate of cinchona febrifuge, cinchonidine, and quinidine must be greater than quinine in this infection, as 50 to 60 per cent. are cured during a short course of treatment. In malignant tertian infections a month's course of quinine sterilizes most cases, so that the parasiticidal rate of quinine must be well over 92 per cent. The obvious line of research is to test carefully these alkaloids on both types of parasites and then select the alkaloid with the highest percentage of cures. The minimum duration of treatment necessary for complete

sterilization should next be investigated. Owing to the difference in the rate of multiplication of these two parasites we would expect the duration of treatment in benign tertian infections to be twice as long as in malignant tertian infections.

3. *Incomplete Destruction or Relapses.*—As we have ruled out the sexual forms, we are left to consider the part the asexual form plays in the production of relapses. (*a*) Resistant forms. Against this theory the following points may be advanced: Such forms have not been demonstrated microscopically. The relapses when plotted form a skew curve. If these forms were present we would expect a secondary wave on this curve. Latency is better explained by gametocyte production. (*b*) The asexual cycle is only partially destroyed by treatment. The gametocytes are produced from the multiplication cycle. Their brake-like action retards the multiplication rate, and explains how long relapses, latency, and spontaneous cures occur. This effect can be expressed by the equation already given for destruction; the fraction "*f*" represents the number of asexual forms converted into gametocytes, and, as they are non-multiplying forms, it is equivalent to destruction.

TABLE III.—*Showing the Relative Counts made on Cases of Benign Tertian Infection Relapsing after Treatment with Quinine.*

Percentage of Gametocytes present in Relation to Asexual Forms.										No. of Cases Observed.
Nil.	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	
4	10	14	7	8	9	3	6	2	—	2*	65

* In each of these two cases only two parasites could be found.

The majority of our relapses showed this gametocyte production, a few showed high counts, and were associated with relapses that occurred eight to ten weeks after treatment.

The tests of a cure I have already dealt with in a previous paper.

The Choice of the Alkaloid.

The first important observation made on taking over charge of the research laboratory at Dagshai, Simla Hills, was that malignant tertian infections were absent. This I have already explained in a previous paper as due to the specific action of quinine. We tested the value of the different methods of quinine administration on more than 600 cases of benign tertian infection, and found that quinine had a low sterilization rate—that is, about 75 per cent. of the cases relapsed in spite of treatment. This marked the first step in our research—that is, that quinine is a specific for malignant tertian and of little value in benign tertian infections. I considered "the total alkaloids cinchona febrifuge" worthy of trial owing to its cheapness and to the fact that the same amount of bark would yield twenty times more cinchona febrifuge than quinine. The latter alkaloid forms only 5 to 6 per cent. of the alkaloids in Indian barks. In India during the war the majority of non-State-aided dispensaries were forced to use cinchona febrifuge for financial reasons. Colonel Alcock, F.R.S., I.M.S., of the London School of Tropical Medicine, has informed me that he used cinchona febrifuge for many years in the treatment of malaria. Sir David Prain has told me that one of the big druggists in Bombay uses cinchona febrifuge in the preparation of his malarial specific, and considers that its curative results are better than quinine. We tested cinchona febrifuge on two series of fifty-three and fifty-seven men, giving 21 grains daily in two divided doses for three weeks, and found that the cure rate was twice that of a two months' course of quinine. The total alkaloids are therefore more efficacious in benign tertian infections. It was obvious from this that there was some alkaloid in cinchona bark other than quinine, which gave this enhanced cure rate. We were able to eliminate the amorphous alkaloids known as "quinoidine," as all cases relapsed and parasites were found in the blood of some of the patients during treatment. Of the crystalline alkaloids, cinchonine was too toxic, and eight of the fourteen cases tested relapsed. The two alkaloids—cinchonidine and quinidine—were tested on 46 and 62 cases respectively, and both gave a cure rate of over 60 per cent. with a short course of three weeks. I may here mention that many medical men have unknowingly used quinidine in the treatment of malarial fevers. Messrs. Howard of Ilford inform me that they sell several thousand ounces of this alkaloid yearly. The majority of it is exported to the East, probably to adulterate quinine. Sir David Prain told me that Howard's quinine, owing to its purity, commands a good price, but was often adulterated in India, the pure quinine being scooped out of the bottle and the cavity filled with the cheaper alkaloid. MacGilchrist on clinical and experimental tests (1915) considered that hydroquinine was better than quinine. The ethylation of the vinyl group ($CH:CH_2$) renders these alkaloids more stable and so less easily oxidized by permanganate; theoretically we would expect these hydro-alkaloids to resist the oxidizing effect of the tissue, and so resist being broken down into inert decomposition products. The hydro-alkaloids are easily prepared by bubbling hydrogen through an alkaloidal solution in the presence of an electrode of platinum or Kelver's nickel. Dr. Blagden, D.Sc., of Messrs. Howard's, is kindly preparing a sufficient quantity of these hydro-alkaloids for further tests. In the present state of our knowledge the alkaloids recommended in the treatment of malaria are hydroquinine for malignant tertian, and quinidine, or possibly hydroquinidine, for benign tertian infections. Dr. H. H. Dale has pointed out to me that, as I had not tested quinidine on malignant tertian infections, quinidine may have a higher cure rate than quinine in this infection.

The Salt to Employ.

The sulphate of quinidine is soluble in 1 in 108 at 10° C. as compared with quinine sulphate in 1 in 720 at 25° C. The sulphate is the cheapest salt and is therefore commonly used. The acid sulphate and bihydrochloride are more soluble, and are used for tablets or injections. The most suitable dose for an adult is 10 grains given twice a day after food. We know that small doses of quinine (1 to 3 grains) are insufficient to control fever, whilst large doses (45 to 90 grains a day) do not increase the cure rate. These large doses only upset the digestion and produce diarrhoea, consequently a large amount of the alkaloid is not absorbed.

CONCLUSIONS.

(*a*) Recommendations for the treatment of malarial fever:

1. *The alkaloid.* Hydroquinine in malignant tertian infections, and quinidine in benign tertian infections. The hydroquinidine has not been tested.
2. The oral is the simplest and most practical method for giving these alkaloids. The intravenous method is the most rapid and should be reserved for pernicious cases. The intramuscular method should only be used when there is vomiting or no absorption.
3. Treatment should be continuous; 10 grains of the alkaloid administered twice daily.
4. The treatment should extend over a month in malignant tertian infections, and from six weeks to two months in benign tertian infections.

(*b*) The employment of an alkaloid other than quinine opens a new line of research in the treatment of malarial fevers. The use of quinidine will lead to:

1. Greater efficiency; as the higher cure rate of quinidine will prevent these relapses.
2. Economy: as benign tertian infections constitute about 50 per cent. of the malarial infections in India, the more extended use of quinidine should decrease the demand for quinine and lower the present inflated market price of this alkaloid.
3. The possibility of India supplying the whole of the need of the British Empire for these alkaloids. The Java *C. ledgeriana* is cultivated with difficulty in India, but has a very high quinine yield, 8 to 12 per cent. The yellow bark *C. calisaya* has also a high quinine content. The crown bark *C. officinalis*, which produces about 6 per cent. of alkaloids, of which 4½ per cent. is quinine and 1½ per cent. quinidine, grows well in India. The red bark *C. succirubra*, which produces about 4½ per cent. of quinidine and 1½ per cent. of other alkaloids, grows luxuriantly in India. For the amount of quinine extracted from Indian barks five times that amount of quinidine could be obtained yearly.

I must finally express my indebtedness to Dr. H. H. Dale, F.R.S., for the very material help and advice he has given me whilst working at the National Research Institute, and to Mr. H. King, M.Sc., for his expert help and

instructions in the chemistry of these alkaloids. Distinctions are invidious, but one cannot help contrasting the ever-ready help and advice that one obtained in any difficulty from the staff of the National Research Institute to that of the suspicious and hindering attitude adopted by many officials whose appalling want of appreciation unconsciously hinders for a time important advances in prevention and treatment.

Sir ARCHIBALD E. GARROD, K.C.M.G., F.R.S.,

Regius Professor of Medicine, University of Oxford.

MY experience during the war led me to regard cold as the most potent influence in provoking blackwater attacks in patients with malignant malaria. The attacks began with the onset of colder weather, and some followed winter bathing contrary to rules. In a few cases there was evidence that quinine contributed to the causation of an attack. A number of patients were treated by the intramuscular injection of gr. x, apparently with benefit, but in one case such a dose caused a slight recurrence of haemoglobinuria. In another case an attack followed an intravenous injection. As all our patients had been treated with quinine there was no opportunity of excluding its influence, but patients who had been treated with very large doses did not seem to be more liable than others. My general impression was that quinine was *not* the essential factor in the causation of the attacks, but that it must be regarded as one of the contributory causes in some instances.

T. S. HELE, M.A., M.D.,

Fellow of Emmanuel College, Cambridge.

The excretion rate of quinine in health shows no great fall from the second to the twelfth hour after a dose by the mouth, from the fourth to the eighteenth hour after an intramuscular dose (after an initial delay), and from the second to the twelfth hour after an intravenous dose. If the excretion rate is any measure of the rate of change of quinine concentration in the blood, these figures give an indication as to time for which quinine is efficacious after administration by the several routes.

The excretion of quinine in blackwater fever is not different from that in health if the kidney is secreting a sufficient volume of urine (6 cases). Of course, in other instances the excretion may be entirely suppressed.

Professor Ramsden's observation that the percentage of quinine excreted on high dosage is very much less than that on low dosage is of considerable interest. In other words, a greater proportional amount of quinine is metabolized on a high dosage. A similar phenomenon may be observed in the dog after the administration of some aromatic drugs—for example, guaiacol. If under normal conditions the pterols excreted free in the urine amount to 40 mg. daily, and the phenols excreted in combination with sulphuric and glycuronic acids to 20 mg. daily, after high dosage with guaiacol the phenols excreted free amount to only 120 mg., while those in combination amount to 600 mg. That is to say, the administered guaiacol produces only a threefold increase in the free phenols excreted, but a thirty-fold increase in the combined phenols excreted. Smaller doses give intermediate figures. The amount of the phenols excreted in combination rises disproportionately to the amount of the guaiacol administered. The reactions involved are complex, but if we regard these syntheses as the ultimate stages in the detoxication of the administered drug, it follows that there may be an optimum effective dose for drugs of this character. Similarly, if quinine itself, and not a metabolic product of quinine, is the active curative agent, perhaps there is an optimum effective dose for this substance.

Lieut.-Colonel Sir LEONARD ROGERS, C.I.E., F.R.S.,

Professor of Pathology, Medical College, Calcutta.

SOME experiments I made showed that the acid hydrobromide of quinine was the least tonic of the soluble quinine salts when given intravenously, for which purpose it is the most suitable salt. I found cinchonine bihydrochloride had the same toxicity intravenously as the corresponding quinine salt, but when given subcutaneously or intramuscularly the cinchonine salt produced cinchonism, which quinine never does by this method of administration. I therefore did some experiments by injecting the acid hydrochlorides of quinine and cinchonine intramuscularly in the gluteal muscles of rabbits, and after killing them at different intervals I estimated the amount of the salts remaining unabsorbed in the muscle and the amount of absorbed alkaloid in the internal organs. The results showed that the cinchonine salt was absorbed three times as rapidly and three times as completely as the quinine salt. I therefore advise intravenous quinine in very severe and dangerous infections. In less severe but relapsing cases, or those in whom quinine causes sickness, I advise 7½ to 15 grains of cinchonine bihydrochloride intramuscularly on four successive days, followed by quinine by the mouth in 20 to 30 grains a day for three or four weeks, and then 10 grains a day for four to six months to prevent relapses and complete the cure.

Dr. M. NIERENSTEIN.

PROFESSOR DIXON has kindly made several references to my report on the excretion of quinine in the urine, it is therefore only necessary for me to emphasize two points.

1. I wish to draw attention to the much lower excretion of euquinine and quinine lactate. I found that whereas quinine and its other salts are excreted to the extent of about 50 per cent., the excretion of euquinine is about 30 per cent., and that of quinine lactate about 40 per cent. I should be glad to see these results confirmed by other workers. They seem to me very important, and suggest many theoretical considerations. In the case of euquinine this is not due to passage through the alimentary canal, since I only found traces of quinine in the faeces.

2. As regards haemoquinic acid, I would like to point out that all we know at present is:

(i) That the organism produces from quinine a substance which I have provisionally named haemoquinic acid.
(ii) That this substance possesses haemolytic properties.
(iii) That this substance is present in larger amounts in blackwater urines than in malarial urines.
(iv) That this suggests, but does not prove, a relationship between quinine, haemoquinic acid, and blackwater fever.

Sir David Bruce, in a letter to me some time ago, referred to blackwater fever as a conundrum. Haemoquinic acid does not solve this riddle; it only indicates some lines on which it may possibly be solved. I believe, however, that it will be worth while to follow up the haemoquinic acid clue; I have therefore started a series of experiments on the oxidation of quinine *in vitro*, but so far all my results have only yielded quitenine. It is, however, possible that quinetoxin will give haemoquinic acid on oxidation, since it contains the CO group in place of CH.OH present in quinine. Here again I am influenced by my provisional formula for haemoquinic acid.

J. C. MCWALTER, LL.D., M.D.,

Dublin.

EVERY soldier has been dosed with quinine and therefore it is impossible to say what the effect would have been if he had got none. We had sent over 100,000 soldiers into malarial districts in the East under the belief that we would prevent the onset of malaria by the use of quinine. At least 80 per cent. of these soldiers who were sent to Lake Doiran and 70 per cent. of those in the Jordan Valley had got malaria. Each of these cases costs the State £1,000—between pensions, hospital treatment and other expenses; probably the cost of malaria in the army was now £50,000,000 a year, and this had mostly arisen because of the supposition that quinine was a prophylactic. One result was that adequate mosquito netting, in the earlier days of the war at least, was not relied upon more exclusively. Quinine had perhaps some influence on the incidence of benign tertian malaria, but it came and went whether quinine was used or not. The problem was malignant tertian malaria and quinine had proved a failure in most cases. In Egypt some gave it in combination with arsenic and iron—when it seemed less useless.

Dr. C. M. WENYON, C.M.G., C.B.E.

DURING the war very few new facts as to the treatment of malaria by quinine were discovered. Towards the end of the war the tendency was to come back to the pre-war methods of quinine administration. Perhaps our know-

ledge of the intramuscular use of quinine has extended; in spite of the necrotic effects on the muscles the good results are most marked. The necrosis which has been produced in thousands of cases has only in a very small minority produced any ill effects; the good results obtained in the method of treatment quite outweigh any ill effects resulting.

Little is known as to how quinine acts. It either acts directly as a toxin or on the tissues by stimulating them to produce a substance which kills the parasites, or it renders the red blood corpuscles unsuitable as food for the parasite. Quinine when administered produces in the next few hours signs of degeneration in the parasites; cultures of the malarial parasites cannot be obtained from the blood of patients who are taking quinine. The red blood cells must contain quinine or some other substance which prevents the parasites growing. In connexion with Major Acton's reference to the different action of quinine in malignant malaria and benign tertian, the failure of quinine to act in the malaria of birds is worthy of consideration and investigation. When quinine is given prophylactically it is generally supposed that it kills the sporozoites when injected by the mosquito. There is no evidence of this; it may be that in spite of the quinine the sporozoites do still enter the red blood corpuscles, and that quinine acts by killing the early stages in the red blood corpuscle. Experiments conducted by me in Macedonia showed that quinine affects the gametocytes of benign tertian malaria more than those of malignant tertian. Mosquitos were readily infected from cases of malignant tertian malaria taking quinine, whereas they were rarely infected from cases of benign tertian malaria if they were being treated with quinine. On the other hand, cases of benign tertian not taking quinine readily infected mosquitos. Blackwater fever in Macedonia most usually occurred directly after a dose of quinine, but a certain percentage of cases were not initiated by a dose of the drug.

DISCUSSION.

Sir LEONARD ROGERS, in reply to Dr. McWalter's statement that quinine was of very little use in malaria, drew attention to the historical evidence, and pointed out that in India, during the first half of the nineteenth century, cinchona bark, and later quinine, were not given in malaria until the temperature had fallen to normal. In 1849 Dr. Hare advocated full doses of quinine during fever, and cured bad cerebral cases which had previously always died. He was given an opportunity of trying his method in the European Hospital in Calcutta, and reduced the fever mortality in one year to one-twelfth of the previous rate. That was conclusive evidence of the value of quinine in malaria, which would hold its place until something better was discovered.

Professor J. A. GUNN, D.Sc., M.D.Oxford, confirmed an observation made by Sir Leonard Rogers to the effect that it was important to give an intravenous injection of quinine slowly and in high dilution. He had found experimentally in rabbits that there was a considerable difference in the minimum lethal dose of quinine according as it was given slowly and in dilution or rapidly and in concentration. This was usually true of intravenous injections of other drugs as well. He mentioned some results he had obtained with two new alkaloids, harmaline and harmine; he had found that both had pharmacological actions similar to quinine. Experiments *in vitro* showed that there was a considerable difference in the resistance of the adult organisms to the alkaloid; he drew the conclusion that relapses in protozoal diseases after treatment might be due to survival of adult organisms, and not necessarily in every case merely to the persistence of spore forms. The alkaloids harmaline and harmine were not found to be so good in acute malaria as quinine, but the latter alkaloid had proved very successful in relapsing malaria and had succeeded where quinine failed. The number of cases was not sufficient to make this certain, but the results so far obtained were encouraging.

Dr. H. H. DALE, F.R.S., speaking as an outside observer in this question, wished to mention one or two points which had struck him in the course of the debate. Referring to Dr. Wenyon's inclination to regard the action of quinine as direct and specific on the parasite, on account of its failure to act on the closely related blood parasite of birds, Dr. Dale suggested that the argument cut both ways. Mr. Dobell and he had succeeded in transferring to a kitten a strain of *Entamoeba histolytica* from a patient who was subsequently cured without difficulty by an ordinary course of emetine. On the same strain of the parasite in the kitten emetine had no effect whatever in any dose. The ineffectiveness of quinine on the bird parasite might be due to difference of host rather than difference of parasite. He emphasized also the importance, from the practical point of view, of Major Acton's evidence as to the value of quinidine. Even if it were only as effective as quinine, the fact might mean a revolution in the policy of planting cinchona, which had hitherto aimed at producing a bark giving a maximum yield of quinine, and had resulted in the breeding of strains which were, on the whole, unsuitable for cultivation in India. If quinidine were even as good as quinine, the supply of alkaloid, as Major Acton had said, could be obtained from *Cinchona succirubra*, which grew with great readiness over large areas in India. Borrowing an Americanism, which in this connexion had a ludicrous appropriateness, Dr. Dale said that there was clearly a possibility that the world-policy of cinchona-planting had been "barking up the wrong tree."

Lieut.-Colonel MCCARRISON, I.M.S., with reference to the intravenous injection of quinine, said that he had recently found, in collaboration with Colonel Cornwall, I.M.S., that whereas a medicinal dose of quinine introduced into the venous circulation of sheep might cause in one animal an alarming and even fatal fall of blood pressure, such a pronounced fall did not occur in other sheep of the same weight. The risk of a fatal fall of blood pressure was likely to be greater the lower the initial blood pressure of the animal. It was found that the addition of 2 or 3 drops of a 1 in 1,000 solution of adrenalin to the solution before injection counteracted this fall. It was a point, therefore, of some practical importance that when in the human subject the initial blood pressure was low the precaution should be taken of adding to the solution a protective dose of adrenalin. In the course of further investigations Colonel Cornwall found that the continued intravenous use of quinine led to a condition of circumscribed necrosis of the adrenal cortex.

Dr. BODMAN (Bristol) asked whether good results had been obtained from the administration of plain saline injections (rectal or subcutaneous) in conjunction with the various forms of quinine. In malignant cerebral cases the capillaries of the organs were filled with infected corpuscles which were not reached by quinine in the circulating blood. If the fluidity of the blood could be increased so as to flush out these capillaries the parasites would be brought into contact with the quinine circulating in the blood. In a few cases which he had been able to treat in this way in Salonica good results appeared to follow, but the cases were too few to justify any generalities.

Dr. C. M. WENYON, in reply to Dr. McWalter, admitted that the prophylactic use of quinine in Macedonia was undoubtedly a disappointment; but though numbers of men got infected in spite of 10, 20, or 30 grains a day, still there was evidence that a certain, perhaps small, percentage were nevertheless protected. It had been said that it was impossible to judge of what would have happened if no quinine had been taken; such an experiment did take place in the Caucasus: 305 men were exposed for four weeks to infection without nets or quinine—within two months 303 men had gone down with malaria. It was, he thought, inconceivable that all these would have been infected if prophylactic quinine had been taken. The percentage of infections in this case was practically 100, which was higher than in any of the worst spots in Macedonia.

Professor DIXON, in bringing the discussion to a conclusion, said that though it had not very closely followed the lines he had suggested in his opening remarks, it had been highly interesting and useful.

BLACKWATER FEVER IN MACEDONIA.*

BY

J. F. GASKELL, M.D., F.R.C.P.,

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(From the 41st General Hospital, Salonica.)

THE nature of blackwater fever is at present undecided, but the work of the majority of recent observers may be summed up in the following conclusions stated by the Panama Canal Commission. Blackwater fever only occurs when a population not immune to malaria becomes exposed to extensive infection by it, when relapse and reinfection are therefore common, and owing to unfavourable conditions proper quinine treatment has not always been obtainable. It has also been found by many observers that quinine is in a very high percentage of cases the determining cause of an attack. When attacks have occurred under observation in hospital, the antecedent administration of quinine has been practically universal. The conditions quoted above were all present among the Allied Forces in the Balkan campaign from 1915 to 1918, and blackwater fever duly appeared. Conditions were especially favourable in the Serbian army, for not only was malaria a comparatively rare disease in Serbia, but also the army became highly infected when training in Salonica in 1916, and owing to various causes proper treatment could not be given.

The 41st General Hospital acted as base hospital to the Serbian army from August, 1916. During the autumn and winter of 1917–18, blackwater fever appeared in the Serbian army, and was treated both by us in this hospital and also by Parsons and Forbes[1] in two other base hospitals attached to the Serbian army.

The question of the existence of a quinine haemoglobinuria separable from true blackwater fever is answered in the negative by these observers, and experience at the 41st General Hospital confirmed this: both mild and severe attacks of haemoglobinuria occurred as a direct result of the administration of quinine, some of the latter proving rapidly fatal. The only possible differentiation would appear to lie in the severity of the attack, a severity which can undoubtedly be influenced by the treatment given. Experience in Macedonia, therefore, gave no justification for any such differentiation.

The relationship of malaria to blackwater fever was always close. By the beginning of August, 1916, when British base hospitals were first provided, the Serbian army had become widely infected with malaria; and the great number of patients admitted during the autumn were suffering from the disease, often in a very severe form. Nevertheless, though thousands of cases of malaria passed through the hospital during the winter, no cases of blackwater fever occurred. The latter disease did not appear till the autumn and winter of 1917–18, when the Serbian army had passed through two severe malarial seasons, and was heavily infected with chronic malaria. If blackwater fever is an independent disease, it is very remarkable that it did not appear in the winter of 1916–17, as the ground then occupied was practically the same as in the following year, and the conditions of existence in the second year were much improved.

The incidence can, however, be explained if the view be taken that blackwater fever only occurs in patients suffering from chronic malaria. The Serbian army was first extensively infected with malaria in 1916, so that the disease was not sufficiently chronic in the winter of 1916–17 for blackwater fever to appear. Evidence of chronic malaria was present in all cases that occurred at the 41st General Hospital.

The nature of the malaria parasite, whether benign or malignant, and the severity of the malarial attack for which quinine was given, did not appear to be of importance. It has been claimed that blackwater fever is only connected with the malignant form of malaria; but cases occurred in which the administration of quinine for a proved benign attack was followed by blackwater fever. It must be remembered that scarcity or absence of parasites in the peripheral blood cannot be taken as evidence that the infection is a malignant one, for both the administration of quinine and the attack of blackwater fever itself cause rapid disappearance of the benign parasite. Some of the cases contracting blackwater fever did not show any great degree of malarial cachexia such as is usually found in the malignant type. Blackwater fever may therefore be associated also with a mild benign tertian infection.

All the cases in the hospital as well as most of those of Parsons and Forbes occurred between October, 1917, and April, 1918; no further cases were seen between April, 1918, and August, 1918; it was therefore a winter disease. The common sequence was a chill followed by malarial relapse, with which blackwater fever was associated.

The relationship of quinine administration to the attack was very definite. Eight attacks of blackwater fever occurred in patients who were already in hospital, and all rapidly followed the beginning of a course of quinine treatment. One attack was of especial interest:

The patient had already been treated for an attack of blackwater fever, but his temperature still remained irregularly raised. Although repeated examinations of the blood failed to demonstrate any parasites, it was thought possible that the condition was malarial in nature, so a further course of quinine was decided upon. On the second day of this course an attack of blackwater fever again took place. Shortly afterwards an abscess declared itself at the site of a subcutaneous saline injection, which had been given in treating the first attack, and the patient was also suffering from pyorrhoea. Subsequent malarial attacks proved to be benign tertian in nature, and parasites were easily found. It is therefore probable that the raised temperature was due to the abscess and the pyorrhoea, and was not malarial in nature. On this hypothesis, the administration of quinine was alone responsible for the attack of blackwater fever—that is to say, quinine can produce an attack in a patient with chronic malaria, though no malarial relapse is present.

The routine method of quinine administration was either 30 grains daily by mouth or 20 grains intramuscularly morning and evening. It was found that the amount of quinine administered before an attack of blackwater fever took place varied in different patients. From this the idea arose that each patient had a critical dose, and that amounts below this could be tolerated successfully. This was tested in three cases who had subsequent malarial attacks.

In one of these, the second known attack followed the administration of 30 grains of quinine by mouth within twenty-four hours. As a result of a theory that intramuscular quinine might be better tolerated than oral quinine, an attack of benign tertian malaria, which followed nineteen days later, was treated with 20 grains intramuscularly on the first day and 10 grains on the following morning. Blackwater fever again occurred. Two subsequent attacks of malaria were successfully treated with doses of 10 grains per day, given in the first instance intramuscularly and in the second orally.

The other two cases were also successfully treated for subsequent malarial attacks with doses below the critical dose. The occurrence of blackwater fever in a case of malaria does not, therefore, contraindicate treatment by quinine for further malarial relapses, if the critical dose is known, for doses smaller than this can be safely given. In a case known to have had blackwater fever, but whose critical dose is unknown, cautious administration of quinine is also justifiable for a malarial relapse, if careful watch is kept for the first signs of blackwater fever; for energetic treatment in the earliest stages, on lines to be given later, should avert the chief dangers of this complication.

The effects of continued administration of quinine, when blackwater fever has declared itself, were in every case very serious.

In one of the early cases a full course of quinine was continued after blackwater fever had occurred. This case died exactly one week later from a further attack, so acute that haemoglobin was only present in the tubules of the kidney and had not yet reached the bladder. In two other cases the administration of quinine for a period of twenty-four hours after the attack had begun caused suppression of urine, which reached a maximum in five days, and was, in one case, complete and fatal, in the other almost complete and only recovered from after a long and severe illness. Two other cases were even more rapidly fatal.

Continued administration of quinine would, therefore, appear to be most dangerous.

The course of the illness varied considerably, but in practically all cases the general condition of the patient on the first day did not appear dangerous. In the severe cases mental confusion and drowsiness became marked

* Abstract of a paper published in the *Annals of Tropical Medicine and Parasitology*, vol. xiv, No. I, p. 3.

on the second day, often accompanied by an increase of the vomiting which had usually begun on the first day. A rapidly increasing jaundice was present in all cases, accompanied in the more severe by marked collapse with a feeble and rapid pulse.

The excretion of haemoglobin did not last many days even when suppression was present. In the later cases where treatment was given early and energetically haemoglobin disappeared within twenty-four hours. Even in the case with marked suppression haemoglobin disappeared in four days. If it be allowed that haemoglobinuria is due to the excretion of the products of haemolysis the latter must therefore be complete within a comparatively short time, even when the clinical condition is severe, and whether quinine is continued or not; for in the case already quoted, in which a full course of quinine was given, haemoglobinuria ceased in forty-eight hours. In this case, however, a continued administration of quinine rapidly again built up haemolytic conditions, for another attack within a week was immediately fatal.

The excretion of albumin always continued after haemoglobinuria had ceased; its duration varied from four days to no less than sixty days in the case with marked suppression. Death appeared to be brought about in two ways: either (1) by toxic poisoning in the early stages of the attack on the second or third day, or (2) by suppression of urine.

The histological changes found in the kidneys of a series of cases all showed that suppression was due to a coagulation of excreted haemoglobin-containing material mainly in the region of the loops of Henle. The first convoluted tubules above the point of obstruction were widely dilated, but their epithelium was normal, cilia even being demonstrable. The cause of suppression is thus a mechanical obstruction.

Treatment should be directed to the prevention of this mechanical blocking, and also to the combating of toxic effects and collapse. The maintenance of blood pressure is of extreme importance from both these points of view; collapse should be combated with brandy and strychnine and other general methods commonly used. The most important line of treatment is, however, the administration of fluids in quantity by every possible path in order to dilute the products of excretion sufficiently to prevent coagulation, and also to dilute toxic products in the circulation. Not only should fluid be taken in quantity by mouth, but rectal salines should be given and continuous subcutaneous saline injections. This treatment should be started immediately the signs of blackwater fever are discovered; it is too late to apply them only when signs of suppression appear, for coagulation in the kidney has then already taken place.

In conclusion, blackwater fever is held to be due to a sudden haemolysis in the blood stream brought about in certain cases of chronic malaria by the administration of quinine; exposure or exhaustion is often a contributory factor. The haemolysis is chemical in nature and completed in a short time. The haemoglobin liberated can be successfully excreted by the kidney if not too highly concentrated; if too concentrated coagulation takes place in the loops of Henle and suppression follows. Quinine should be stopped at once; its further administration is both dangerous and unnecessary, for the blackwater fever attack itself destroys the malarial parasites. In any particular patient a critical dose of quinine is necessary to produce an attack of blackwater fever. Malarial attacks in such a patient can be successfully treated by doses below this limit.

REFERENCE.

[1] Parsons, L. G., and Forbes, J. G.: Observations on a Transient Form of Haemoglobinuria occurring amongst the Troops in Macedonia, *Journal of the Royal Army Medical Corps*, vol. xxxii, p. 373, May, 1919.

NUMEROUS preparations which have been sold in Austria as neo-salvarsan have been found on examination to consist of lead or potassium chromate, plaster-of-Paris, and heavy spar, without a trace of salvarsan.

ACCORDING to *Paris Médical* (May 29th), the association of French medical journalists has unanimously passed a resolution protesting against the description under German names, in the Supplement to the *Codex Medicamentarius*, of drugs of French origin. The appearance of hexamine under the name urotropine is a case in point.

ON THE TREATMENT OF LUPUS VULGARIS BY THE LIQUID ACID NITRATE OF MERCURY.

BY

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ONE of the most difficult therapeutic problems in the out-patient department of a hospital for diseases of the skin is that of the treatment of lupus vulgaris. Of the newer methods of treatment: Tuberculin has proved disappointing—even dangerous; *x*-ray applications have but a limited field and are used only for healing ulcerated surfaces or for destroying the warty condition in lupus verrucosus; Finsen light can, indeed, claim excellent cures in selected cases, but it is impracticable in the very numerous examples of lupus of the nose and deep tissues adjacent, in crusted and ulcerated lupus, or where very large areas are involved. In the majority of cases of lupus vulgaris we are obliged still to rely upon the older methods of caustic applications, either with or without previous scraping.

The so-called "selective caustics" play a large part in the modern treatment of lupus. The term "selective caustic" refers to a caustic which picks out the lupus nodules without damaging the healthy skin. In my own practice I have made prolonged trials of a number of selective caustics—namely, of caustic potash, of arsenical pastes, of chloride of zinc, of nitrate of silver, of trichloracetic acid, of potassium permanganate, of salicylic and pyrogallic acids, and of Dr. Ellis's recently introduced "brass ointment." The term "selective caustic" has a relative not an absolute meaning, for whether a particular caustic is selective or not depends upon the length and strength of its application. Caustic potash, for example, has, when first applied, a remarkably selective action on the lupus nodules, but it very soon finds its way into the surrounding healthy tissues, unless applied sparingly and with very great care. Chloride of zinc, contrary to what one might expect, can, on the other hand, be freely applied in a deliquescent state without much destruction of healthy tissue, and is a valuable agent for use after scraping. With nitrate of silver, however freely it be used, one generally fails to destroy even the whole of the lupus tissue. Arsenical paste, salicylic acid, and pyrogallic acid have a distinctly selective action on the lupus nodules, but a too prolonged application of either of these may lead to some sloughing of the surrounding tissues. The selective action of "brass ointment" upon lupus nodules is even more striking than that of any of the other caustics mentioned, for it picks out each lupus nodule, leaving a sharply punched-out ulcer. But a long experience of the use of this medicament has led me to regard it as of use only as a preliminary application, since it fails completely to destroy the lupus infiltration, and the nodules remain on the healing of the ulcers.

Until recently, in my own experience, chloride of zinc and pyrogallic acid have proved to be the most manageable and the most effectual, and my routine treatment of lupus vulgaris has been either:

(1) Scraping with the Volkmann spoon followed by free application of deliquescent chloride of zinc; or (2) repeated applications of pyrogallic acid, either in the form of Boeck's paste—

Acid. pyrogallic. Resorcin Acid. salicylic.	}	...	...	...	...	āā partes 5
Gelanthi Talc	}	...	...	...	...	āā partes 7

Ft. pasta moll.

or as an ointment according to the method of Jadassohn—

Acid. pyrogallic.	...	...	...	...	10 to 20
Vaselin.	...	...	...	...	100

The pyrogallic acid method consists in applying the paste or ointment, spread upon lint, and bound to the affected part by strapping. When the dressing is removed after twenty-four to forty-eight hours, the lupus nodules are found to have been "picked out" by the acid and partially destroyed by ulceration. The process is repeated with ointments of diminishing strength until the ulceration heals under their application.

In a small proportion of cases cures have been effected after a few applications, but in many others the improvement has ceased after reaching a certain stage and has progressed no further in spite of repeated treatments.

Quite recently I have employed in the treatment of a large number of cases the liquid acid nitrate of mercury and believe to have found in this application a remedy of the selective caustic type which far surpasses any other method of treating lupus in its efficacy and in its rapidity of action.

The liquid acid nitrate of mercury has been for long known as a potent remedy for certain tertiary syphilitic sores and fungating syphilitic granulomata, but it seems never to have been widely used in the treatment of lupus. Most of the textbooks mention this caustic in a perfunctory manner or "damn with faint praise." In the medical journals I have been able to discover only two definite statements as to its real value in lupus. In the *Medical Times and Gazette*, 1855, vol. i, p. 9, is the following account:

A solution of the nitrate of mercury in strong nitric acid is in very common use at the Hospital for Cutaneous Diseases, and constitutes a very convenient form of caustic. Its formula is—

℞ Hydrargyri ... ... ʒj
Acid. nitrici (sp. gr. 1.50) ... ... ʒij
Solve.

The solution produced is a clear, colourless fluid.

Its usefulness and methods of employment in carbuncle, in acne, in boils, in lupus, for sloughing ulcers, and in moles, naevi, etc., is then related in detail.

"*In Lupus.*—The acid nitrate is one of the most efficient and convenient forms of caustic in this disease. Mr. Startin does not, however, employ it solely, but uses also the biniodide of mercury and a paste of which arsenic is the principal ingredient. (See page 11, for July 1.) The acid nitrate is chiefly used in indolent tubercles, and to indurated patches not actually ulcerated. After ulceration has occurred the arsenical paste is preferred."

The second reference is to be found in the *British Journal of Dermatology*, vol. viii, 1896, p. 44, and is as follows:

"Mr. Marmaduke Sheild showed a case of lupus vulgaris of the nose treated by acid nitrate of mercury. The patient was a delicate-looking woman, aged 27. She had suffered from lupus vulgaris of the nose for over four years, and had undergone so many scapings 'that she could not remember them.' The pure acid nitrate of mercury was applied on six occasions, the parts being previously well soaked with 20 per cent. cocaine. The parts affected were the tip and alae of the nose, the septum, and a portion of the lip. The parts had now soundly healed over, and no trace of lupoid tissue could be seen. It was intended to keep the case under observation, and apply the same remedy to any recurrent nodules of the disease that might present; so far as one could judge a definite cure seemed likely to result."

My own experience of the treatment of lupus with acid nitrate of mercury covers only a period of some nine months, but the results obtained have been so successful that one wonders why this already known remedy should have remained neglected.

The cases which have been treated by this method in the skin department at St. Bartholomew's Hospital may be arranged in four classes:

1. Single patches of non-ulcerated lupus of the size of a shilling to that of half a crown, and which have received no previous treatment.
2. Old cases of lupus which have been treated by other methods, but in which lupus nodules still remain in the scars.
3. Ulcerated lupus, often of large extent and with much surrounding inflammatory infiltration.
4. The common type of lupus of the nose, involving frequently also the nasal septum, the palate, the upper lip, the cheek, and sometimes the lacrymal sac and skin over and around, a type very difficult to deal with by Finsen light or by scraping.

The liquid acid nitrate of mercury is applied by means of a small swab of wool tightly twisted round the ends of a finely pointed pair of forceps. It is painted on to the affected areas freely and with firm pressure for one to two minutes, taking care to limit the application exactly to the lupus patches, to isolated nodules, or to ulcerated surfaces. In the case of isolated nodules or non-ulcerated lupus patches the effect of the application is after a minute or so to change the semi-translucent reddish-brown "apple jelly" lupus tissue, so that it takes a dry yellowish-white opaque appearance. No dressing is applied and the patient is seen again in a week. The yellowish-white opaque appearance has then given place to a thin brownish crust, which falls in a few days and leaves the affected area sometimes completely healed, sometimes as a shallow ulcer which heals in a few days. In many instances a single application has been sufficient to replace the lupus by a smooth healthy scar without any remaining lupus nodules. In other cases isolated nodules have remained in the scar and it has been necessary to repeat the application one or more times. The application is only slightly painful at the time, but is followed by more severe pain for several hours.

In the case of ulcerated lupus, after removing all crusts, the solution is freely painted on to the ulcerated surface. This causes considerable pain, but if a not too large area be done at one sitting it is easily borne by most patients. The after-effect upon ulcerated surfaces is rather different from that upon non-ulcerated lupus. The surface of the ulcer becomes dry yellowish-white, but in a few days much serous exudation gives rise to a thick heaping up of crust. At the end of a week the crusts are picked off, or bathed off, and there is then an ulceration with purulent surface, and a margin of pink healthy epidermis which heals in the course of a week or so. The number of applications required in an ulcerated lupus depends upon the extent of the disease and the depth of the inflammatory infiltration which often accompanies these ulcerations.

In those cases where the nose is involved the treatment by Finsen light or scraping is rendered difficult owing to the deep involvement of tissues other than the skin. The disease, which usually starts in the mucous membrane of the anterior part of the septum and spreads hence through the whole thickness of the nose to appear as nodules in the skin of the nose, sometimes also perforates or destroys the cartilaginous septum, spreads upwards to involve the lacrymal sac, downwards to the upper lip, backwards to the hard and soft palates, and along the lymphatics to appear upon the skin of the cheek midway between the nose and the ear. But even in these difficult cases where much of the disease would seem to be out of the reach of a local caustic application, the liquid acid nitrate of mercury has produced far more rapid improvement than any previously adopted method of treatment. A lacrymal abscess may be swabbed with the solution. The solution may be carefully painted on to lesions in the nose or on mucous membranes, and all nodules or ulcerations on the skin surface similarly dealt with. In extensive cases all this may be done at one "sitting" under a general anaesthetic; but it can also be carried out gradually without any anaesthetic by applying the acid little by little to different parts at different visits. No complete cure can as yet be claimed in an extensive case of lupus. The period of employment of this remedy has not yet been sufficiently long. But the good results already obtained seem to justify a more general use of the acid nitrate of mercury in the treatment of lupus.

HEALING OF A TROPHIC ULCER OF THE GREAT TOE IN AN AGED GLYCOSURIC PATIENT.

BY

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PHYSICIAN TO THE LINCOLN COUNTY HOSPITAL.

THE complete healing and treatment of a large trophic ulcer under circumstances so adverse appear to be worth recording.

The patient, an old lady aged 82, has the following remarkable family history: Her mother died aged 86, and her father aged 75; four brothers lived to 86, and one to 84; one sister lived to 89, one to 86, one to 85, and two to 84.

She was first seen by me in March, 1919, when she was suffering from bronchitis and a failing heart. She stated that she had suffered from diabetes for twenty years; that when this was first discovered she was strictly dieted, and that the diet had been gradually relaxed, she having kept fairly free from symptoms for some years. She did not take any sugar and very little starchy food. She had been more or less blind, due to double cataract, for fifteen years. She was physically very feeble, and had a good deal of adipose tissue; her muscles were very flabby, as was also her heart, and there was a good deal of bronchitis. Mentally she was remarkably bright and vigorous. The urine contained a considerable amount of sugar; she was passing 100 to 125 grams a day; there was no acetone nor diacetic acid present. With rest in bed, expectorants, and cardiac stimulants the bronchitis cleared up, her heart became stronger, and she was able to get up at the end of a month and

remain up for several hours a day. Her diet was fairly varied, but sugar and very starchy foods were forbidden. She took a drachm and a half of sodium bicarbonate every day. The amount of sugar in the urine dropped to 24 grams a day.

During the summer and autumn of 1919 she kept fairly well, and was able to get about the house and garden, but at times complained of pain in her legs due to peripheral neuritis.

In December the pains became more severe, and she had increasing difficulty in walking, and her general health was failing. About December 29th the pain became most severe in the right leg and foot, and there appeared a bulla 1 in. in diameter at the base of the right great toe on the outer side; there was no history of any injury; the bulla was full of dark sanious fluid; the cuticle gave way in a few hours, leaving a raw unhealthy surface. In two days there was a typical trophic ulcer surrounded by a zone of inflammatory oedema. The ulcer slowly increased in area and depth, and the inflammatory redness and oedema spread up to the middle of the dorsum of the foot. The urine contained from 125 to 150 grams of sugar a day; the prognosis was anything but hopeful.

She was kept in bed, and the carbohydrate intake was gradually reduced to a minimum, and fats were also limited; alkalis and nux vomica were prescribed. She complained much of pain in the toe and foot at night; for this she took one or two tablets of omnopon ½ gr. which gave her great relief. At the onset the whole of the foot was most thoroughly cleaned and painted all over with picric acid 24 gr. to ℥j in methylated spirit, and was then powdered with boric acid powder; the ulcer was dressed with sterilized gauze, and pieces of gauze were kept between all the toes; the whole foot and leg were enveloped in gamgee and kept slightly raised.

The ulcer continued to increase; small ones appeared on the heel and between the second and third toes, but quickly healed. By the beginning of February the ulcer had spread round and involved the base of the second toe, covering in all an area of two square inches and extending almost to the bone and upwards in the interdigital space for a full inch. The patient's general health, however, had improved, and the urine only contained 20 grams of sugar a day.

From February 14th the whole foot was cleaned twice a day with methylated spirit, and the greatest care was taken in removing every particle of necrosed tissue from the ulcer, which was then freely swabbed with spirit and filled in with a paste of bismuth carbonate and liquid paraffin, which was removed and fresh used at each dressing.

After a month of this treatment the ulcer ceased to spread, and all the inflammatory reaction around had disappeared; at the end of six weeks slow healing commenced, and continued uninterruptedly until, by the middle of May, the site of the ulcer was completely covered by sound scar tissue and the whole foot was sound. The symptoms of neuritis were much less in evidence.

The patient is now (June 3rd) able to be up most of the day and walk from room to room and go out in the garden. She was fortunate in having a particularly efficient and painstaking nurse; this I think was more than half the battle.

A NOTE ON A METHOD OF TREATING HAY FEVER AND PAROXYSMAL RHINORRHOEA.

BY

MORLEY AGAR, M.R.C.S., L.R.C.P.,

LONDON.

DURING the past four years my attention has been concentrated on the treatment of hay fever, paroxysmal rhinorrhoea and allied conditions. The results which are being obtained at the present time lead me to believe that great relief can be given to the majority of patients.

The method employed, which so far as I am aware has not been used previously, consists essentially in treating the vestibule of the nose. The vestibule, that is to say, the in-turned skin of the nostrils, is carefully examined for any fissures or sore spots and a note made of their whereabouts; it is then rubbed with an astringent lotion, silver nitrate gr. xxx to the ounce being the solution I generally use. The rubbing is carried out thoroughly and systematically; particular attention is paid to two spots, the first is high up on the outer wall and the second is the floor about half to three-quarters of an inch back from the orifice. No part of the vestibule must be missed, and the nostril must be stretched to open up the folds. I make no application to the mucous membrane, I do not touch it if I can help it, but it is possible that some of the solution goes in further than I intend.

The results up to the present show that all cases of nasal rhinorrhoea treated by this method have been cured; that condition appears the easiest to treat.

Good results are obtained also with patients suffering from hay fever. This year seven patients were treated about a month before the symptoms were due and have practically escaped. It is true there have been occasional slight "reminders," which, however, merely serve to show that they have not outgrown the complaint. All seven regard themselves as cured.

Some cases of asthma have also been treated, but the results have been less satisfactory, although some improvement has been obtained. In all cases of paroxysmal sneezing and asthma the external auditory meati should be inspected for impacted cerumen, dermatitis, etc. In what may be called extreme cases of hay fever I do not use the silver nitrate at first, but apply an anaesthetic solution to the vestibule and a wide area around.

℞ Acidi carbolici	... ...	m iij
Olei menth. pip.	... ...	m vj
Sp. vini rect.	... ...	ʒ iv

Misce. Fiat pigmentum.

After a few minutes lotio calaminae (U.C.H.P.) should be applied to an even wider area of the face. I should like to draw attention to the manner in which the application of this anaesthetic solution to the nasal vestibule relieves the eye sensations in hay fever and clears up the occasional blurring of vision of which many people complain although they are not subject to hay fever. I believe that the efficacy of the treatment depends upon diminishing the abnormal sensitiveness of the skin.

If a normal person paint the vestibule with the silver nitrate solution he will not experience the slightest irritation nor will any reaction follow. If, on the other hand, the person is subject to one of the diseases mentioned above a reaction of varying intensity will follow. His eyes will water, he will sneeze a few or many times, and both nostrils will run copiously, a milky fluid coming away, and in some cases a cough and temporary feeling of tightness of the chest will occur. The reaction lasts from half an hour to twelve hours.

This convinces me that our aim in treatment must be to lessen the hyperaesthesia of the skin of the vestibule.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MONILIAL GASTRITIS.

A RATHER anaemic woman, aged 42, had suffered for years from ulcer of the stomach, which about three months before seeing me was so bad that her doctor sent her to bed for a month on strict diet. Great relief followed, and soon after she was sent to the seaside for a month. Improvement was steady, and she was now on the way back, staying with relatives till fit for duty. Feeling uncomfortable the day before, she resumed strict diet and called on me. A simple alkaline mixture was prescribed, the diet approved, and rest advised during most of the day.

A few days later I was called in and found that, though only Benger's food was taken, about two hours after there was belching and vomiting of sour matter. Not much was made out by palpation except that there was little or no tenderness. The patient was thin. The mouth was in good order, and the bowels were regular. A little of the vomit taken for examination soon settled into an opalescent fluid with a flocculent sediment. Under the microscope a trace of sediment showed food débris with considerable numbers of yeast cells and moderate numbers of sarcinae and *B. geniculatus*. The last, being presumptive evidence of malignant disease, was quite unexpected, and its association with the other two suggested the transition stage. Even so, after months of careful diet and weeks in which the stomach was not obstructed, it was difficult to account for all this yeast. On getting it in pure culture the yeast proved to be a fermenter of maltose, but not of saccharose—practically conclusive evidence that it was the common thrush fungus in yeast form.[1] Further examination proved that it was *Monilia albicans*, and capable of producing thrush.

In approximately healthy mouths traces of thrush fungus are common enough, and are the sources of infection for sucklings, but mouth contamination could not

[1] BRITISH MEDICAL JOURNAL, 1913, ii, p. 1460.

account for the multitude of yeast cells in this vomit (which was examined within an hour).

Vomiting was rather troublesome for twenty-four hours, during which she remained in bed, and was treated with sips of hot water containing sodium bicarbonate, and only hot milk with water was taken. Then a period of comparative comfort followed, proving that there was no organic obstruction. This suggested that, if growth in the stomach is equal to that often seen in the mouth, the thrush fungus is capable of causing obstruction at the pylorus, partly due to fungal growth and partly to gastritis. Moreover, monilial gastritis probably occurs apart from malignant disease, for yeasts are common in the stomach in various conditions, and their identity is seldom investigated.

I have already reported[2] a monilial infection of the bowels in a child apart from any evidence of stomatitis. It may have been a complication of some other affection (the child is now in good health), but it is a mistake to suppose that monilial infections are confined to the tropics.

In conclusion, I may state that in a few weeks the woman showed evident signs of malignant disease of the stomach, and died in a few months.

Ealing, W. ROBERT CRAIK, M.D.(Glas.).

DISLOCATION OF HUMERUS BY MUSCULAR ACTION.

ON June 20th an epileptic, J. S., aged 16, was seen to get into bed; ten minutes later his mother in the next room heard him making a noise, and, coming into his room, found him lying on his *right* side in bed, and still in the clonic stage of a fit. Ten minutes later, on recovering consciousness, he complained of his *left* shoulder, which was then seen to be deformed. On my arrival twenty minutes later I found subcoracoid dislocation of the humerus, which was reduced with ease. The shoulder was normal before, and no fall could have taken place during the fit, so muscular action must have caused the dislocation. He had never dislocated his shoulder before. This complication of an epileptic fit is mentioned by Sir Frederick Taylor in his *Practice of Medicine*, but it must be very rare.

Teignmouth. F. W. MORTON PALMER, M.D., B.Ch.

Reports of Societies.

HERPES AND CHICKEN-POX.

AT a meeting of the Edinburgh Medico-Chirurgical Society held on July 7th, Dr. R. FLEMING presiding, Dr. CLAUDE B. KER discussed the possible relationship of herpes and chicken-pox. Cases suggesting this had been reported, especially by Le Feuvre in Rhodesia, Kay, and Parkes Weber. There were various clinical groups:—(1) Cases of herpes followed by chicken-pox in another individual, but within the limits of the incubation period of the latter. This was the most numerous group, and many of the cases were difficult to explain as coincidences; though the possibility of error of diagnosis, and a distribution of chicken-pox modified by local irritation, must be remembered. (2) Cases of chicken-pox followed by herpes in another individual. (3) Herpes and chicken-pox occurring simultaneously in one person. (4) Herpes and chicken-pox occurring simultaneously in two persons. After making full allowance for other possibilities, there remained in group 1 cases that were difficult to explain except on the theory of some connexion between herpes and chicken-pox, and the theory of identity could not be repudiated until a prolonged collective investigation had been carried out by general practitioners.

Dr. A. GOODALL said that the difference in severity between herpes and chicken-pox was against the theory. Dr. J. S. FOWLER said that the great frequency of chicken-pox might explain its occasionally following herpes, and he emphasized the great difficulty in tracing the source of infection in these diseases.

Prognosis in Heart Affections.

Dr. W. T. RITCHIE emphasized the importance of prognosis in heart disease. It depended, he said, upon a full examination, clinical and instrumental, and accurate diagnosis, and upon the consideration of such extra-cardiac factors as the condition of vessels, kidneys and lungs. He then specially considered prognosis in four clinical conditions: (1) Dilatation, following overstrain, very seldom occurred in a healthy heart. If at an age when arterio-sclerosis was present, prognosis should be guarded, and permanent disability often remained. In dilatation due to acute infectious disease the occurrence of a murmur at the apex suggested endocarditis. Where the murmur was not accompanied by displacement of the apex, nor by a forcible apex beat, the prospect of recovery was good, although postponed for one or two years. (2) Disordered action of the heart was frequent not only in military but also in civil life. The prognosis was good if proper treatment were carried out. This consisted in restoring the patient's confidence; in getting him out of bed; in passive and then in graduated active exercises. Drugs, including digitalis, were generally superfluous. Cure was obtained in 69 per cent. of military cases. Results were not quite so good in civil life where neurasthenics were intractable cases. (3) In extra-systoles the prognosis was good in young adults with healthy hearts where the cause was emotional excess or tobacco; also in the aged. But in persons over 40 it might be grave because of commencing coronary arterio-sclerosis, and if pulsus alternans was present it presaged death in one or two years. Ventricular extra-systoles were better than auricular or nodal. Multiple extra-systoles were worse than single. (4) Auricular fibrillation was generally the last act in the drama. It was least grave where the pulse was relatively slow, the ventricles not dilated, and oedema absent, and where the response to digitalis was good. When associated with chronic nephritis it indicated impending death.

Myopia.

Dr. H. M. TRAQUAIR gave notes of 11 cases of low grade myopia where the complaint was of near vision only and not of distant vision, as in the majority of myopes. In the series, 8 were females and 3 males, and the average age was 20.6 years, the extremes 8 and 30. All were engaged in near work. The myopia present averaged 0.95 dioptre, the extremes being 0.25 and 2.0 dioptres. No cases with any astigmatism, or with anisometropia of more than 0.25 dioptre were included. No case showed heterophoria. All were ordered a full correction to be worn for all purposes, and the symptoms were relieved in every case, mostly very rapidly. Thus relief of "eyestrain" was obtained by causing the ciliary muscle to do more work, and thus to restore the relationship between accommodation and convergence, a very slight disturbance of which can produce discomfort in certain individuals. The danger of over-correction of myopia in young persons by examination without atropine is greatly exaggerated. A full correction should be advised to be worn for near work as well as for distant vision.

Blackwater Fever.

Dr. A. GOODALL described the chief clinical features of 14 cases of blackwater fever in Salonica. There was in the great majority a history of previous malaria, and in 11 parasites were found in the blood. There were two deaths, and a notable feature of the autopsies was the presence of blood in the collecting tubules and in the ascending limb of Henle's loops in the kidneys. The treatment was immediate and massive doses of quinine, given, if the patient's condition permitted, intravenously. The speaker deduced from the above cases that blackwater fever was a phase of malaria, determined by exposure to cold. It was objected that blackwater fever was rare in malarious districts, but in his view blackwater fever was often overlooked, while the different seasonal incidence could be explained on the assumption that cold was a determining factor. He referred to experimental haemolysis in animals by such agents as phenylhydrazine, where blood cells and blood pigment were found in the kidneys, especially in the collecting tubes and ascending limbs of Henle's loops; and deduced an analogous action of the malarial parasite in blackwater fever.

AT a meeting of the London Association of the Medical Women's Federation held on June 15th at 11, Chandos Street, W., with the President, Mrs. FLEMMING, M.D., in the chair, Dr. JANET CAMPBELL read a paper on the

[2] BRITISH MEDICAL JOURNAL, 1913, ii, p. 1206.

Ministry of Health. She first briefly outlined the history of public health legislation from the beginning of the reign of Queen Victoria, and then discussed the reasons for the establishment of a central health department. The general functions and duties of the Ministry were then described, with particular reference to the medical organization of the health services. A discussion followed, in which Dr. DOBBIE, Dr. JEVONS, Dr. JOHNSTONE, Dr. BOYLE, Dr. IREDELL, Dr. SHEPPARD, and others took part.

Reviews.

HEAD'S STUDIES IN NEUROLOGY.

DR. HEAD'S well known work which carries on the lamp lighted by Hughlings Jackson, and is complementary to Professor Sherrington's *Integrative Function of the Nervous System*, is now brought together in a readily available form in his two volumes of *Studies in Neurology*.[1] With some modifications and additions, made for the convenience of the reader, the contents are reprints of seven papers from *Brain* between 1905 and 1918, and present the results of eighteen years' patient investigation carried out with an infinite capacity for taking pains. Each of the papers originally contained an account of the methods employed in testing sensation; and to minimize repetition these separate descriptions have now been combined into a single chapter which follows the introduction. There is an epilogue on the common aims underlying this study of function in man by clinical methods, and an appendix dealing with some of the most serious criticisms of the views expressed by the author and his collaborators about the functions of the peripheral nervous system. The originally separate monographs are now arranged in an orderly sequence, extending from the peripheral nervous system to the receptive centres in the brain, and are grouped into four parts: (1) Introductory remarks and the methods of examining sensation, with an account of their clinical application; (2) the peripheral nervous system; (3) the spinal cord; and (4) the brain. Probably many readers will be disappointed to find that Dr. Head has not thought it advisable to include his early papers (1893, 1894) "On disturbances of sensation, with especial reference to the pain of visceral disease."

The section on the peripheral nervous system opens with "The afferent nervous system from a new aspect," being the substance of the Marshall Hall Address before the Royal Medical and Chirurgical Society of London in 1905; it outlines the detailed results of the two following contributions—namely, an elaborate account of the consequences of injuries to the peripheral nerves, written with Mr. JAMES SHERREN (1905) and based on examination of numerous patients at the London Hospital since 1901, and "A human experiment in nerve division," giving the observations made with Dr. RIVERS on the sensory phenomena following division of the radial and external cutaneous nerves in Dr. Head's left arm on April 25th, 1903. The observations, carried out under the strictest precautions, were continued until December 13th, 1907, and the full paper, published the next year, further established the classical division of the afferent fibres in the peripheral nerves into the three systems: (1) Of deep sensibility, conducting impulses produced by pressure and running mainly with the muscular nerves and so not destroyed by section of all the sensory nerves to the skin; (2) termed protopathic and responding to painful cutaneous stimuli and to the more extreme degrees of heat and cold; this form of sensibility is due to specific end organs gathered together in the skin to form sensory spots, the spaces between being devoid of this sensibility; and (3) called epicritic, to the skin only, subserving the function of cutaneous localization, the discrimination of the two points of a compass and the finer grades of temperature. The internal organs are endowed with the first two afferent systems. These three peripheral systems in all probability develop at different phylogenetic periods, each system reacting differently to the mass-stimuli of daily life. To the criticisms brought against this conception Dr. Head now replies, and to those brought by von Frey and by Boring with considerable vigour.

Part III contains two monographs, that on the grouping of the afferent impulses within the spinal cord, written in collaboration with Dr. THEODORE THOMPSON in 1906, and the much more recent (1917) contribution, with Dr. G. RIDDOCH, "on the automatic bladder, excessive sweating, and some other reflex conditions in gross injuries of the spinal cord." Comparison of the loss of sensation produced by division of the peripheral nerves with that resulting from injury or disease of the spinal cord shows that there are fundamental differences, and that as soon as a sensory impulse reaches its first junction in the spinal cord it becomes shunted into tracts devoted to the conduction of impulses grouped in a manner different from that found in the peripheral nerves. Thus the impulses started by cutaneous painful stimulation, and travelling by the protopathic fibres, and those due to painful pressure and arriving by the deep system of nerves, become combined and separated from all other sensory impulses that may have accompanied them in the peripheral paths. This process of transmutation and recombination takes place on the same side of the spinal cord as that on which the impulses enter.

The research undertaken with Dr. Riddoch, noticed in our issue of April 20th, 1918, illustrates Dr. Head's aphorism that "clinical diagnosis is a by-product of scientific investigation," for while the authors set out to elucidate the physiological principles underlying the symptoms in paraplegia their observations have a very practical bearing on the vesical disorders. After complete section of the spinal cord there is, instead of the normal discriminative reflex in response to a stimulus, a "mass-reflex" with overflow of energy into distant channels resulting, for example, in evacuation of the bladder and rectum and sweating. This mass-reflex is a revival of the primitive method of response which cannot occur under normal conditions of higher neural control, and is an example of the law laid down more than fifty years ago by Hughlings Jackson that in lesions of the nervous system positive symptoms are usually the result of the removal of the control normally exerted by the higher over the lower centres.

In the section dealing with the brain there are two monographs: the first, on sensory disturbances from cerebral lesions, in collaboration with Dr. GORDON HOLMES, provided the matter for the Croonian Lectures of 1911 before the Royal College of Physicians, and gives a general conception of the mechanism underlying sensation. The observations were made on human subjects in whom disease, accident, or surgical interference had produced some stationary lesion, the general health being otherwise perfect; there were twenty-four patients with clinical evidence of disease of the optic thalamus, sixteen with localized lesions of the surface of the brain, and others. There are two great sensory centres in which afferent impulses end to evoke the state called a sensation; these are the optic thalamus and a considerable part of the cerebral cortex. All the secondary paths of sensation terminate in the optic thalamus, where sensory impulses are grouped afresh and redistributed either to the cortex or to a mass of grey matter in the optic thalamus, which is the centre for certain fundamental elements of sensation—namely, pleasure, discomfort, and consciousness of a change in state. The lateral zone of the optic thalamus is the organ by which the cortex controls the essential thalamic centre; and the excessive response to peripheral stimuli, or Roussy's *syndrome thalamique*, which is characteristic of a lesion of the lateral zone, is due to removal of the inhibitory influences of the cortex, following destruction of the cortico-thalamic paths, and not, as has been widely assumed, to irritation. The nature of the sensory activity of the cortex dealt with in the first monograph is further elaborated in Dr. Head's recent paper in *Brain* (see also BRITISH MEDICAL JOURNAL, February 1st, 1919) on "Sensation and the cerebral cortex." The sensory activity of the cortex is not associated with the crude recognition of touch, pain, heat, and cold, but it endows sensation with the three following discriminative faculties: the recognition of spacial relations, a graduated response to stimuli of different intensity, and the appreciation of similarity and

[1] *Studies in Neurology*. By Henry Head, M.D., F.R.S., in conjunction with W. H. R. Rivers, M.D., F.R.S., Gordon Holmes, C.M.G., M.D., James Sherren, F.R.C.S., Theodore Thompson, M.D., and George Riddoch, M.D. Two volumes, pp. 862; 182 figures. Published by the Joint Committee of Henry Frowde and Hodder and Stoughton. 1920. (£3 3s.)

difference in external objects brought into contact with the surface of the body.

In conclusion, these *Studies* command our sincere admiration for the enormous amount of patient and rigidly controlled research, for these new and extremely important conceptions on the mechanism of sensation, and for the broad philosophic lines on which these epoch making investigations have been directed.

ORTHOPAEDICS, PAST AND PRESENT.

DR. OSCAR VULPIUS of Heidelberg is well known in and beyond the borders of Germany as an orthopaedic surgeon of distinction, so that his pamphlet[2] on his twenty-five years' experience is sure to arouse interest.

It is divided into twelve chapters, the first five of which deal with the development and methods of the specialty, and each of the remaining seven is devoted to consideration of some one of the more important maladies that come generally under the care of the orthopaedic surgeon. The struggle in the early part of the nineteenth century between the advocates of the mechanical and the dynamical methods, the first relying almost entirely on instruments and the second upon massage and exercises, ended in a compromise. Then came the era of tenotomy and other operative methods. Antiseptics revolutionized practice for a time and bade fair to lead to the extinction of the specialty, as it caused the disappearance of many orthopaedic institutions in Germany. After a struggle, however, the necessity of the specialty was proved by the good results obtained by those who devoted themselves to the treatment of deformities. The need for early treatment of the results of injuries coming under the industrial insurance scheme had something to do with this. Later on the institutional treatment of tuberculosis of the bones and joints became of great importance as a part of the general schemes for the care of cripples.

Dr. Vulpius claims that the treatment of fractures and injuries of joints and of amputation stumps belongs to the realm of orthopaedics, as well as chronic diseases of bones and joints, and all diseases and injuries (including paralysis) of the soft parts which tend to result in contraction and deformity. He insists on the necessity for orthopaedic hospitals and clinics, where all the latest appliances are available for treatment of patients. Many cases must be treated as in-patients. In considering mechanical (or instrumental) orthopaedics Dr. Vulpius deals with the difficulties which arise when the attempt is made to give sufficient support or fixation to the affected part or limb, without impairing the already imperfect nutrition by constriction and pressure, and without overburdening the already weakened muscles. The complete solution of the problem is impossible, but the cry of "Away with apparatus!" is expressive of a widely-felt objection to instruments. Among the lessons to be learnt from war experience of artificial limbs one, according to Vulpius, is the necessity of early treatment of leg stumps and the early use of provisional prostheses. Another is that the old peg leg and the kneeling leg are obsolete. Different types of limbs are advisable for hand-workers and for head-workers. For those belonging to the latter class the author thinks that the fibre leg with solid felt foot which is made in the workshop of his clinic is the most suitable form as regards lightness, strength, simplicity, and appearance. Similar difficulties have been met in Germany, in the provision of artificial arms, to those encountered in this country. They have not yet been overcome, and the attempts made to do so are not unlike our own. Dr. Vulpius is very cautious in expressing any opinion on the prospects of kinematization of stumps. This prudent restraint is in strong contrast to the exaggerated statements of Sauerbruch and his school.

Among orthopaedic surgical proceedings operations on tendons have an important place; Vulpius states that he has quite given up simple transverse tenotomy in favour of his sliding method (Rutschenlassens) applied to the junction of tendon and muscle-belly. When a defect has to be supplied he prefers transplantation of tendon or fascia to artificial silk tendons. Other questions concerning tendon, nerve and joint orthopaedics are discussed, but he maintains that operations are only the preliminary stages of treatment, which to be successful must be followed by after-treatment of various kinds. The right lines on which to treat congenital club-foot, static flat-foot, congenital hip dislocation, infantile palsy, scoliosis and bone and joint tuberculosis are briefly laid down. Compressed into these eighty pages is to be found the fruit of much labour and the ripe experience of an accomplished surgeon, which will well repay perusal by those who read German.

[2] *Aus 25 Jahren Orthopädischer Arbeit.* Eine therapeutische Orientierung für den prakti-chen Arzt. Von Professor Dr. Oscar Vulpius, Heidelberg. Berlin and Vienna: Urban and Schwarzenberg. 1920. (Cr. 8vo, pp. 80. M. 12.)

NOTES ON BOOKS.

The Industrial Clinic,[3] in which nine authors deal with various branches of industrial medicine, will be found extremely useful by factory medical officers and by welfare workers, for both of whom the editor, Dr. EDGAR COLLIS, in his introduction, states that it is intended. In the preparation of this manual the co-operation has been secured both of those who have long been concerned with this branch of medicine and of others who during the war were led to apply to the problems of industrial health methods and ideas which were the fruit of experience gained in other fields. In two of the most interesting sections Mr. B. Muscio, M.A., gives an account of modern scientific methods of choosing, testing, and placing the worker, and Dr. H. M. Vernon has collected many early and recent experimental observations (made both by himself and by others) in connexion with the causation and prevention of industrial fatigue, of which accounts have been given in our columns. Dr. Lucy Cripps contributes a practical and up-to-date account of the individual hygiene of the employed. Dr. Leonard Hill deals concisely with food values in relation to occupation, and Mr. M. J. Hall gives an admirable account of canteen factories. Dr. W. F. Dearden describes the work of the certifying factory surgeon, and Dr. H. B. Adamson writes of factory clinics for women. The manual embodies much important material taken from Government publications issued during the last decade, and hitherto not accessible in collected or convenient form; it contains adequate lists of references and a useful index.

The second part of the first volume of the Spanish archives of phthisiology,[4] a periodical appearing thrice yearly, contains five original papers, a "doctrinal work" on hilum tuberculosis in infancy giving a summary of the subject, and notes on various topics of importance to those interested in pulmonary tuberculosis. Among the original articles is an interesting paper by Dr. Rodés of Barcelona, in which good reason is shown for believing that a loud venous hum noted about the right upper chest and back of a phthisical man of 31, continuous but louder during systole and on deep inspiration, was due to pressure on the vena azygos near its termination. The volume before us is very well printed and got up, and the character of the matter it contains affords striking evidence of the vigour with which medical science is being pursued in Spain.

A Roll of Honour of past and present teachers, students, sisters, nurses, clerks, and employees of St. Thomas's Hospital has been compiled by Mr. Robert S. Hopkins, who is known to generations of St. Thomas's men. The list includes 1,481 names of those who served in the great war; of these, 71 old students, one nurse, and 9 employees gave their lives. Of the medical members 582, and of the nursing staff 92 received honours and awards. The roll of honour has been made complete up to April, 1920. It is well printed on good paper, and has as frontispiece an excellent view of the hospital from Westminster Bridge. It may be obtained for 3s. 6d., including postage, from Mr. R. S. Hopkins, Central Hall, St. Thomas's Hospital, S.E.1.

[3] *The Industrial Clinic: A Handbook dealing with Health in Work.* By several writers, edited by E. L. Collis, M.D., M.R.C.P. Modern Clinic Manuals. London: J. Bale, Sons, and Danielsson, Ltd. 1920. (Demy 8vo, pp. 247; 9 plates; 2 figures. 10s. 6d. net.)

[4] *Archivos Espanoles de Tisiologia.* Publicados por el Dr. Luis Saye (Barcelona). No. 2, vol. i, May, 1920. Barcelona: Sociedad General de Publicaciones. 1920. (Double roy. 16mo, pp. 169–352; illustrated. In Spain, 25 pesetas per year; abroad, 30 pesetas per year: numero suelto, 10 pesetas per year.)

IN an introductory note to the last number of the *Cambridge Bulletin* (a list of books published by the Cambridge University Press) it is stated that there is evidence of a revival of interest in English literature in certain foreign countries. A special exhibition of English books was held recently in Sweden, and arrangements have been made by the Syndics of the Press for the sale of its books in the United States and Canada through the Macmillan Companies in New York and Toronto.

PRESENTATION TO DR. J. A. MACDONALD.

THE following appeal is made to all members of the British Medical Association. It is signed by the President, Sir T. Clifford Allbutt, the Chairman of Representative Meetings, Dr. T. W. H. Garstang, the Treasurer, Dr. G. E. Haslip, and by past chairmen of Representative Meetings.

Dr. J. A. Macdonald, the Chairman of Council of the Association, retired from that position at the end of the Annual Representative Meeting, 1920, after serving for the record period of ten years, and the members of Council invite the members of the Association to join with them in recognizing the distinguished services of one of the most popular and most respected of our members, and one who has given unsparingly of his best to the Association.

Dr. Macdonald became Chairman of Representative Meetings in 1906, retiring in 1909. He has been chairman of some of the most important committees of the Association and a member of all. He visited, at the request of the Association, the New Zealand, Australian, and some of the Far Eastern Branches in 1914, and is going on a similar errand to South Africa in October next. He has been a Direct Representative of the profession on the General Medical Council since 1911. In short, for the last seventeen years, whenever the Association has required exceptional services demanding sound judgement, devotion to the interests of the Association, and a commanding personality, it has called on Dr. Macdonald, and never in vain.

Dr. Macdonald is a general practitioner in a single-handed practice. To those who have any conception of the demands made on a man filling the posts enumerated above, no further words are required to indicate the sacrifices that Dr. Macdonald has made on behalf of the Association. The Council believes that the members of the Association will desire to show their gratitude to Dr. Macdonald in a fitting and adequate manner. It is proposed that the presentation shall take the form of a personal gift to Dr. Macdonald, and also, if the response justifies it, that some permanent memorial of his work for the Association shall be established—possibly in the form of a medal or prize.

Subscriptions of any amount will be welcomed, but no individual subscription may exceed five guineas. Cheques should be made payable to "The Macdonald Presentation," and sent to the Medical Secretary, British Medical Association, 429, Strand, W.C.2. The subscriptions will be acknowledged in the BRITISH MEDICAL JOURNAL, and further notice will be given of the exact form of the gift and the time and place of its presentation.

The following subscriptions have been received up to and including the first post on Monday, July 19th:

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The appeal, which has been issued to all members in the United Kingdom, has not been issued to members resident overseas, it being the intention to make the appeal to such members through the secretaries of the Overseas Divisions and Branches. A communication to Overseas Divisions and Branches is being issued.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee 13 cases were considered and £138 voted to 10 of the applicants. The following is a summary of three of the cases relieved:

Widow, aged 77, of M.D.Lond. who died in 1899. Has two daughters, aged 51 and 38; the elder attends to the home, and the younger is an invalid. Income from leasehold property £170 per annum, a large portion of which goes on repairs. The lease of two houses will fall through in four years. Rent £17, and rates on one house £26. Have had to sell one house during the last twelve months to meet the expenses of dilapidations and repairs. High cost of living is making it impossible to make ends meet. Voted £18 in twelve instalments.

Daughter, aged 63, of M.R.C.S.Eng. who died in 1877. Only income about £25 from investments. Has acted for many years as housekeeper, receiving board and lodging for her services. Suffers from ill health. Relieved five times, £60. Voted £12 in twelve instalments.

Daughter, aged 81, of M.R.C.S.Eng. who died in 1859. She suffers from ill health, and is now losing the sight of one eye. She receives about £78 from friends, and £30 from another charity. Relieved eight times, £111. Voted £20 in twelve instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., C.B., F.R.C.S., at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is overwhelmed, in these days of exorbitant prices for clothing and household necessaries, with applications for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles for the benefit of the widows and children who, in happier times, would not have needed assistance. The gifts should be sent to the Secretary of the Guild, 43, Bolsover Street, W.1.

British Medical Journal.

SATURDAY, JULY 24TH, 1920.

THE FIRST YEAR OF THE MINISTRY OF HEALTH.

THE Ministry of Health passed its first milestone on July 15th, when a vote for seventeen millions and a half—the total expenditure is estimated to be ten millions more—was taken in the course of the debate in supply. The vote afforded Dr. Addison the opportunity of making his first annual statement. It fell into two parts, which met with very different receptions. The first part dealt with housing, the second with the direct preventive work of the Ministry. Under the second head he referred to the success which had attended the measures taken to exclude typhus fever and plague. The prevalence of the former disease in Poland and adjacent countries during the last two years has been widespread, and the medical officers of the Ministry are to be congratulated on their share in preventing the extension of the epidemic to Western Europe. The danger is not over, and the unfortunate war now in progress, by aggravating the misery and poverty of the inhabitants of Poland, is likely to render the disease more inveterate there. But to protect this country to-day from typhus fever is a comparatively simple matter, our mode of life having advanced to a stage little congenial to the particular circumstances of the infection, and the same may with some confidence be asserted of plague. But Dr. Addison made a much bolder claim when he hinted that our freedom from an extensive epidemic of influenza last year was in large part due to the exertions of the group of experts constantly in session to devise means for warding off the danger, and to the distribution of vaccine; influenza has a way of falsifying prophecies, and though he made none the implication was obvious, and his compliment to the weather unconvincing. His reference to tuberculosis was more guarded, and the position is, indeed, discouraging. The Minister spoke with justifiable pride of the way in which the outbreak of rabies has been controlled, and of the fact that no person treated after being bitten has so far developed the disease. Again, his satisfaction with the evidence that patients are increasingly disposed to take advantage of the venereal centres was justified, as was his invitation to the advocates of different methods to fall to instead of falling out.

Perhaps the most hopeful of all his statements was with regard to infant mortality. Most hopeful because the decline of the infantile death rate from 150 twenty years ago to 78 in the year ending March last seems to prove that the efforts of the last fifty years have not been thrown away; the main credit for this great achievement belongs in about equal proportions to the officers of the municipal public health service and to the educational propaganda carried on by voluntary workers in the face of indifference, and often obstruction. But the credit of the initiative belongs to the medical profession, for in the early days it supplied the majority of these workers and all the facts. At the meeting in Bristol the other day to consider the Report of the Medical Consultative Council the President of the Bath and Bristol Branch, Dr. Watson-Williams, very appropriately recalled the early action of the British Medical Association. At its annual meeting in 1867 a resolution was adopted, at the instance of Dr. H. W. Rumsey of Cheltenham, which foreshadowed the appointment everywhere of medical officers of health, and indicated the need for drastic amendments of the public health law. The Association appointed a committee, which associated itself with another appointed by the Social Science Association; in the following year the joint committee made strong representations to the Secretary of State and the Chancellor of the Exchequer, and in that year also the need for the establishment of a Ministry of Health was urged in our columns. Year by year afterwards the Association hammered away at the subject, and finally in 1918 the Representative Meeting—and this time with success—urged upon the Government the importance of immediately establishing a Ministry of Health. Dr. Addison said no word of the history of the efforts the medical profession so persistently made to induce Parliament to recognize its duty to provide means for the prevention of disease. The first annual review of the work of the Ministry of Health would have been an appropriate occasion to inform the House of Commons and the public, for memories are short. Perhaps at some future time he will find opportunity to repair the omission.

Members cheered the sketch Dr. Addison gave of the medical research work subsidized by Parliament, and of the results already obtained in some directions. The fact is significant, for well within the memory of many now living the epigram of a Chancellor of the Exchequer that the endowment of research spelt perambulators was vociferously applauded by a House of Commons still obsessed by the mediaeval idea of the celibate clerk. Dr. Addison told the House that the money it had expended had proved a very good investment, and the implication was that the system was economically sound. We take leave to say that it is not; it is profitable to the State, but is unfair to the individual, and therefore unsound. The House of Commons must cease to regard research as a side track and its results as by-products. No man engages in medical research with the idea of becoming rich, but he must have a living wage, and that includes provision for old age. Medical research and teaching interdigitate, and a solution may be found along this line, for it is urgent to review the conditions under which professors, lecturers, and demonstrators now hold their appointments.

Through all these parts of his statement Dr. Addison passed unscathed, but he had to stand a running fire of criticism of what he said about housing. Undoubtedly the results are most disappointing, but Sir Donald Maclean's criticism was two-edged. He complained that not only had no accumulated war arrears been touched, but that the arrears of last year had not nearly been met. This is true, but he ought to have added that the arrears of house-building had begun to accumulate years before the war, and that no party in Parliament had taken effective means to tackle the question. We are not called upon to assess the exact amount of truth in Mr. Austin Hopkinson's vigorous indictment of Parliament, wherein he alleged that by allowing the Ministry of Health to impede private building enterprise it is aggravating the dearth of houses, with all that that means in disease and misery. It is for building and financial experts to decide. The public is rightly irritated, and is inclined to use the argument of the Queen of Hearts—"that if something wasn't done about it in less than no time, she'd have everybody executed all round."

SOME RECENT ADVANCES IN PHARMACOLOGY.

Two very interesting addresses dealing with recent developments in pharmacology have lately been delivered. The one is the address, printed at page 113, with which Professor W. E. Dixon opened the discussion upon quinine and its substitutes in the Section of Physiology and Pharmacology at the meeting of the British Medical Association at Cambridge. The other is the presidential address delivered by Mr. C. A. Hill to the meeting of the British Pharmaceutical Conference in Liverpool this week.

The importance of modern synthetic drugs is very generally recognized, but less attention has been paid to the advances made in the pharmacology of the active principles of the old-established vegetable drugs. During the last century many vegetable drugs have been abandoned, and very few new ones of first-rate importance have been introduced, but our knowledge concerning the active principles of the old drugs has steadily advanced, although at times the advance has been of a rather spiral nature.

As Mr. Hill pointed out, the advance in the pharmacology of the majority of the really important vegetable drugs has followed certain general lines: at the commencement of last century, the therapeutic uses of various crude drugs that had been used in medicine since the dawn of history were known, but nothing had been ascertained about their chemistry; then, during the first half of last century, the active principles of these drugs were discovered, and it was soon found that the action of the crude drugs was due almost entirely to these active principles; finally, prolonged research revealed the chemical constitution of these principles, and in some cases methods were discovered by which they might be synthesized.

The chief advance made by recent research has, however, been along two fresh lines: first, it was doubtful, in some cases, whether the pure alkaloid was a completely satisfactory substitute for the old crude preparations, and careful researches were undertaken to see whether the other active principles present in the crude drug, hitherto more or less ignored, might not be of importance, either on account of some action of their own, or by virtue of their adjuvant action in increasing the potency of the principal alkaloid. Moreover, the pharmacologist was not satisfied with assuming that the particular chemical compounds present in plants were of necessity the best possible chemical compounds for clinical use; therefore, with the assistance of the organic chemist, he endeavoured to produce new modifications of the old well-established drugs.

The case of the cinchona alkaloids illustrates in a particularly interesting manner the important recent advances that have been made by research along these lines. Until quite recently, cinchona would have served as an example of a drug that had been almost completely superseded by one of its active principles. For cinchona preparations are very little used, whilst quinine is used in enormous quantities, and may well be considered the most important drug in the pharmacopoeia. As long ago as 1866 other alkaloids of the cinchona bark—namely, cinchonine, cinchonidine, and quinidine—were tested upon 1,200 cases of malaria in India, and were found to exert a curative effect, but no notice was taken of this discovery. During the past few years, however, Major H. W. Acton has shown that the alkaloids cinchonidine and quinidine are actually more effective than quinine in curing cases of benign tertian malaria.

This conclusion is of immense practical significance, since to secure a supply of an efficient remedy for malaria is a matter of great imperial importance. Pure quinine can only be obtained in large quantities from the plantations in the Dutch East Indies, yet a variety of cinchona tree the bark of which yields a high percentage of quinidine grows luxuriantly in India, and if this drug proves a satisfactory substitute for quinine, the needs of the whole empire could without any great difficulty be supplied by India.

Thus, in the case of cinchona bark, research has led us along the spiral course already mentioned: first came the introduction of the bark in the sixteenth century, then the isolation of the alkaloid quinine in 1820 and the replacement of the crude preparations by the one alkaloid, and now the most recent research showing that quinine is only an imperfect substitute for the crude preparations. Research, however, has not been stopped at this stage, for we now know which of the other alkaloids of the bark are of particular value, and we even know which alkaloid is of greatest value for each of the different types of malaria.

These, however, are only part of the results obtained by recent researches upon the alkaloids of the cinchona bark, for attempts also have been made to produce from the naturally occurring alkaloids substitution products of greater activity than the naturally occurring forms, a subject to which Professor Dixon devoted much of his address. Hydroquinine, a reduction product of quinine, is considered by Major Acton to be more efficacious than quinine for the treatment of malignant tertian malaria. Moreover, several derivatives of hydroquinine possessing most interesting pharmacological properties have been prepared. Ethyl-hydrocupreine is perhaps the most interesting of these bodies; this substance will kill pneumococci at a very low concentration, and it has been found possible to cure animals of pneumococcal septicaemia by its intravenous injection; no clinical results of well-established value have yet been obtained with this drug, but obviously there are here great possibilities for the future. Other quinine derivatives have been shown to possess very interesting powers as local anaesthetics and antiseptics.

These results of the researches upon the derivatives of the cinchona alkaloids indicate the lines upon which some of the most important future developments of pharmacology are likely to proceed. Nature supplies a series of alkaloids, most of which we cannot at present synthesize; the possibilities of these naturally occurring alkaloids have not yet been fully exploited, but research is not confined to the naturally occurring forms, for the organic chemist can furnish the pharmacologist with long series of substitution products.

The work of testing such series must of necessity be long and consist very largely of a series of disappointments, for the therapeutic action of a drug depends upon a balance of chemical and physical properties about which we know scarcely anything; hence the only practicable method is to sort out the few useful forms from the majority of useless ones by means of extensive trials upon animals, and then to pass on to the clinician the few selected substances.

The clinical testing of such drugs is perhaps the most difficult step in the whole process, for the human mind is always over-optimistic, and only a rigidly critical observer, working with most carefully arranged controls, will avoid raising false hopes continually. The opportunities for such work have till now been deplorably scanty in England, but the future holds more promise. Even when all the conditions necessary for the testing of new drugs have been obtained, a

very great amount of work is required to produce the smallest real advance, but the practice of therapeutics, advancing on these lines, although it may advance slowly, is at least keeping on a firm foundation, and it will not drift to and fro with every change of the currents of fashion, as one irrational craze succeeds another, returning at the end to its starting-point without having gained any new knowledge, as has so often happened in the past. The number of new facts that careful research has brought to light concerning drugs like the cinchona alkaloids, whose action was thought to be fairly fully understood, should at any rate convince everyone that there are unlimited possibilities of advance in therapeutics, if only the right methods of research are applied.

LISTER MEMORIAL FUND.

AT a public meeting held at the Mansion House in October, 1912, it was decided to commemorate the work of Lord Lister by placing a tablet with medallion and inscription in Westminster Abbey, by erecting a monument in a public place in London, and by the establishment of an International Lister Memorial Fund for the advancement of surgery, from which either grants in aid of researches bearing on surgery or awards in recognition of distinguished contributions to surgical science should be made, irrespective of nationality. At a meeting of the general committee held in the rooms of the Royal Society on Monday last, the chairman, Sir Archibald Geikie, stated that the sums received in respect of subscriptions from the British Empire and foreign countries amounted to £11,846 5s. 10d. Expenses incurred in printing, stationery, postage, advertising, etc., amounted to £390. The report stated that delay had necessarily occurred in carrying out all the proposals adopted at the Mansion House meeting, but that a memorial tablet, executed by Sir Thomas Brock, had been unveiled in Westminster Abbey on November 1st, 1915, and steps were being taken for the erection of a monument in a public place in London. In order to carry out the scheme for the establishment of the Memorial Fund it was resolved to award a sum of £500, together with a bronze medal, every three years, in recognition of distinguished contributions to surgical science, the recipient being required to give an address in London under the auspices of the Royal College of Surgeons of England. The award will be made by a committee consisting of members nominated by the Royal Society, the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the University of Edinburgh, and the University of Glasgow. Any surplus income of the general fund after providing for the erection of a monument, and after defraying administrative expenses, will be devoted either to the furtherance of surgical science by means of grants or invested to increase the capital of the fund. The continued carrying out of this scheme in future years will require the provision of some permanent and adequate machinery, as the Lister Memorial Committee cannot, in view of its constitution, be itself permanent; it has therefore been arranged that the Royal College of Surgeons of England shall become the trustees and administrators of the Lister Fund. The subscription list is still open, and the honorary treasurer of the fund is Sir Watson Cheyne, Bt., to whom donations may be addressed at the Royal Society, Burlington House, London, W.1.

THE INTERNATIONAL SOCIETY OF SURGERY.

THE International Society of Surgery, in the foundation of which Professor Depage had so large a part, held its first three biennial meetings in Brussels, and its fourth in New York in April, 1914. Professor W. W. Keen of Philadelphia was then elected president of the fifth meeting, which it had been arranged to hold in Paris in 1916. He opened this meeting in Paris on Monday last by an address in which he said that those present at the meeting in New York little dreamt that within three months the dogs of war would be loosed on faithful Belgium and heroic France, and that, when Britain's honour was touched, she too would spring to arms in defence of the rights of humanity. The heart of the people of America was with the Allies then as it is now. When finally the Americans were allowed to come to the aid of the Allies they sprang exultantly to their help. Professor Keen then touched briefly on various points of immediate interest. He referred to the great triumphs of medical science in the war, and how the experimenter in the laboratory and the clinician in the hospital had been wedded at the bedside. Institutions of research in all countries and the new Red Cross Laboratories at Geneva gave assurance that the wonderful work would be developed. The medical profession, he said, must never lower the high standard which distinguished it from a trade; a new remedy, a new splint, or a new method of treatment should be free, so that a device made in Philadelphia should be as available in Paris, in Tokio, in Capetown, or in Buenos Aires as in America. Speaking of what had been done during the war to check venereal disease, he said that after all the only sure and permanent deterrent must be a change of moral atmosphere. There should be a single standard of sexual morality for both sexes. Eleven of the forty-eight United States had passed laws to safeguard the community; the requirements varied from a medical certificate after a physical examination to a mere affidavit of one or both parties that they were free from any communicable disease. It was too soon to know what the result of this legislation would be. In the unselfish devotion to the welfare of the community, in the fight for pure water and pure milk, and wholesome housing, the medical profession was always the leader. After referring to what had been done in the prevention of typhoid and yellow fever in particular, Dr. Keen appealed to the medical profession to lend its support to the crusade for the prohibition of alcoholic beverages. The results so far in the United States, although prohibition had not yet been rigidly enforced, was a largely decreased number of admissions to hospitals, houses of correction, and common lodging houses. Whatever the claims of scientific experiment on the effect of alcohol might be, the huge experiment on the millions of human beings in the United States was, in his opinion, conclusive; total abstention from alcohol resulted in less poverty, less crime, less disease, fewer accidents, and smaller expense to the city and the State. In conclusion, he paid a tribute to the courage doctors had shown, not only in the war, but in combating pestilences, such as plague, typhus fever, cholera, and yellow fever.

INTESTINAL PATHOLOGY IN THE PSYCHOSES.

COTTON, Draper, and Lynch, impressed by the fact that 75 per cent. of patients grouped in the functional psychoses over a period of eighteen months were fit for discharge after treatment of local infective foci in teeth, tonsils, stomach and cervix, have made further search for possible sources of infection in the lower intestinal tract. Chronic intestinal invalidism was evident in these cases from previous histories and from the presence of sallow face, indented tongue, unilateral tenderness over the right hypogastrium, with toneless muscles and evidence of caecal dilatation. In twelve chronic cases x rays confirmed the physical signs, and on exploratory laparotomy a great variety of intestinal lesions were invariably found; operation in more recent cases, which had failed to respond to the routine treatment of teeth, tonsils, etc., showed without exception similar pathological conditions of the lower intestinal tract. In a preliminary report [1] the authors

[1] *New York Medical Record*, May 1st, 1920.

insist on the importance of bacteriological and histological investigations. They cultivated various strains of streptococci and colon bacilli from the enlarged mesenteric glands; the presence of these bacteria in the walls and tissues of the intestine showed the part played by infection in producing toxaemias associated with mental disorder, and explained the reason why treatment directed towards the intestinal lumen only may not be effective. When the area of intestine and mesenteric glands infected is too extensive for surgical removal reliance has to be placed upon serum and vaccine therapy. From the great variety of lesions found there can be no operation of choice, the mode of procedure often having to be determined after the abdomen is opened. Operations to correct abnormal positions or to relieve pressure are useless; an operation directed against infection is alone justified; laparotomy should not be undertaken until all other foci of infection have been removed. The cases fell into two groups, those requiring developmental reconstruction of the colon, resection of the terminal ileum, caecum, ascending and part of the transverse colon, and, in a few, resection of the descending colon and sigmoid, and those requiring only appendectomy because of a limited infection. The results show the frequency with which such intra-abdominal pathological conditions are present in the insane, and point to the necessity for their early recognition, for the authors believe that if these conditions had been recognized and relieved years before many of these cases might never have been sent to asylums.

INCOME TAX AND POST-GRADUATE COURSES.

We have received inquiries as to whether the cost of a post-graduate course is an admissible expense for income-tax purposes. The question is not free from difficulty and cannot be answered categorically. The principle involved is that of discriminating between capital expenditure and current or revenue expenditure; the former would include outlay on improvements, the latter the cost of maintaining the standard at an existing level. This principle is seen most clearly in connexion with manufacturing equipment; the expenses of the installation of an additional machine represents capital expenditure incurred to improve the output, the cost of replacing an existing machine by another of similar capacity is a current expense fairly chargeable against income. In which class is the expense of a post-graduate course to be placed? We entertain no doubt on general principles of equity that payment of fees for a post-graduate course is current or revenue expenditure and a proper deduction, but equity and statute law sometimes conflict, and we can imagine an Inland Revenue official arguing that if attendance on such a course improves the individual's capacity as a practitioner the expenditure is to be regarded as an outlay of capital nature similar to an earlier outlay on the ordinary medical curriculum preceding qualification. To this we would reply that attendance on a post-graduate course serves the purpose of merely maintaining the old standard of knowledge and training relatively to the progress of medicine. That being so, we submit that the Inland Revenue should regard the expenditure as analogous to that incurred by a manufacturer who spends money in improving the organization of his factory by, for instance, taking out an obsolete machine and replacing it by a more modern one better to serve the same purpose. We conceive that it is only by the application of this principle that the question can be determined; at the same time it would be possible for the Inland Revenue to argue that attendance at a post-graduate course serves both purposes. We suggest, therefore, that this is one of those questions which should be dealt with in a spirit of reasonable compromise, and not without losing sight of the fact that the nature of the expenditure is such as to put the State under a moral obligation to refrain from discouraging any practitioner from incurring it. In view of the progress of medical science in recent years, it may be suggested that for the greater part the courses are provided for the "renewal" of earlier training; if that be granted, then it follows that a corresponding proportion of the cost should be allowed for income tax purposes.

MEDICAL ASPECTS OF WORKMEN'S COMPENSATION.

The Departmental Committee on Workmen's Compensation, which was appointed in May of last year and includes among its members Dr. Farquharson, M.P., has presented a compendious report in sixteen parts, making in all eighty-six closely printed pages. After recommending that the present system of insurance should be continued subject to certain modifications and with compulsory powers, the Committee recommends a number of changes in the definitions and administrations of the scheme. Several of these alterations would affect the medical provisions. It is suggested, for example, that the powers of the medical referee should be enlarged so as to authorize him not only to decide the matter referred to him on appeal, but also to pronounce on the actual condition of the workman at the time of his examination. It is recommended that any medical and surgical aid necessary in addition to the medical treatment already available under the National Insurance Act should be provided for the injured workman at the cost of the employer under a comprehensive scheme to be worked out by a Commissioner in co-operation with the Ministry of Health; this would be only one of the duties of the proposed Commissioner. The Committee considers it of great importance to the satisfactory working of the Act that the fullest use should be made of the services of the medical referees in any dispute as to the extent and cause of the workman's incapacity; the statistics and evidence before the Committee is said to have made it clear that this is not secured under present conditions. It is therefore advised that Schedule 1 (15) be extended so that the registrar of the county court, on application by either party, may, after hearing the parties, and subject to a right of appeal from his decision to the judge, refer the matter to a medical referee. Either party, it is recommended, should have the right to obtain a summons for the referee to sit as assessor with the judge, the referee to be given the right of asking the witnesses questions through the judge. The possibility that the whole-time medical officers proposed to be appointed by the Ministry of Health under the National Insurance Act may undertake the work of the medical referees under the Workmen's Compensation Act as part of their official duties, can, the Committee considers, well be explored when the Ministry's scheme has reached a more mature stage.

EDUCATION OF STAMMERING CHILDREN.

A report presented lately to the Education Committee of the London County Council states that medical inspection has afforded data justifying the estimate that there are about 1,200 stammering children in the London schools, and that boy stammerers outnumber girl stammerers in at least the proportion of three to one. The actual number notified was 914, of whom 682 were boys and 232 girls. Five classes, of twenty children each, were first formed and kept under observation by the school medical officer, who reported that out of 76 children 34 were discharged cured at the end of the first term, and that 32 others had improved and should receive further training. Careful investigation in the case of each child from the medical point of view showed that there were two distinct sets of cases. In one the stammering came on together with the development of speech; these cases were the more difficult to cure. In the other the stammering came on later after a period during which the child spoke normally. Frights of various kinds were frequent causes; air raids during the war played a part. Night terrors and nightmare were associated with many of these cases. The majority of the children were found at the outset to possess very poor chest development with marked rigidity and spasmodic

breathing. Part of the training was accordingly directed towards the improvement of the condition of the chest, with the object particularly of inducing relaxation. In the case of one class held in Brixton, the medical officer found that, out of twelve children in whom the stammering was first noticed at or before the sixth year of age, only three were cured by the end of the course, whereas out of seven children in whom the stammering developed after the age of six, six were cured. In two of these seven children the stammer was ascribed to the effects of fright (one by air raid, the other by a dog), two were imitative cases, and two were ascribed to rheumatic fever. The most noticeable feature about the aspect of a class of stammerers at the beginning was the strained and anxious look they collectively presented. It was amazing how this improved during the course, as the children found more confidence in themselves and entertained solid hope of cure. It was considered by the medical officers that it was a disadvantage to have older boys and girls together in the same class, as the children appeared to be more self-conscious in the presence of those of the other sex, and an exaggerated self-consciousness is, of course, a special feature of the mental state of the stammering child. As a result of a recent reorganization the classes now consist of twelve children only, and boys and girls are instructed separately. The teachers are specialists in speech training who have had experience, under medical direction in hospital departments, of dealing with speech defects. The method used is purely educational or re-educational, and has for its basis the intensive assistance to and direction of the pupil's own efforts to overcome his fear and want of confidence. Graded exercises of progressive difficulty are given and every kind of accessory help is utilized—in particular the development of breathing capacity and muscular control and relaxation. It is expected that the arrears will be overtaken in a few years; younger children will then be admitted in larger proportions. As it will be difficult for such children to travel alone the attendance at the classes, it is expected, will fall off, and the centres will then be moved outwards towards the county boundaries. When this happens the Council will be able to offer to co-operate with extra-metropolitan authorities within whose areas the number of stammering children is too small for local classes.

MATERNAL SYPHILIS AND FETAL MORTALITY.

IN his presidential address to the American Association for the Prevention of Infantile Mortality, in 1915, Dr. J. Whitridge Williams developed the idea that the recognition and treatment of syphilis early in pregnancy constituted the most fruitful field for the reduction of fetal mortality. His address was based on a clinical study of 700 fetal deaths occurring in 10,000 consecutive deliveries in the obstetrical section of the Johns Hopkins Hospital: syphilis was found to be responsible for 26 per cent. of these deaths, of which it caused many more than were due to any other single factor, the toxaemias of pregnancy not excepted. Dr. Whitridge Williams has now[1] recorded a fresh series of 4,000 deliveries (with 302 fetal deaths) investigated from April, 1916, to December, 1919. During this period every woman attending the clinic, in addition to examination for clinical signs of syphilis and to careful inquiries regarding medical history, was made the subject of a Wassermann test of the serum. Every placenta was examined histologically, and every child born dead or dying after delivery was submitted to an autopsy in which particular attention was given to the recognition of syphilitic lesions and the demonstration of the presence of spirochaetes. All patients giving a positive Wassermann reaction were treated and "followed up" by social workers. Of the 4,000 patients, 1,839 were white and 2,161 black women, and the Wassermann reaction was positive in 2.48 and 16.29 per cent. respectively (397 cases altogether). In addition there were 105 Wassermann-negative cases, in 44 of whom a serum test had shown evidence of syphilis during antecedent pregnancies, but in whom the reaction had become negative after treatment; in the remaining 61 cases autopsy revealed spirochaetes in the fetus, or the live child showed clinical signs of hereditary syphilis, or the placenta showed characteristic histological lesions. Of 302 dead babies, 89, or 34.44 per cent., were proved to be syphilitic. For purposes of comparison the proportions of other causes of death are quoted; they are: Toxaemia, 11.55 per cent.; prematurity, 10.59 per cent.; placenta praevia and premature separation, 5.28 per cent.; fetal deformity, 3.64 per cent.; unknown and unclassified causes, 19.3 per cent.; and dystocia (including disproportion between fetal and maternal measurements, birth injuries, prolapse of the cord, etc.) 15.2 per cent. Syphilis may have been a causative factor in some of the deaths ascribed to prematurity. It is admitted that this unusually high incidence of syphilis was partly attributable to the large number of black women included among the mothers. Nevertheless, even when the white patients only were considered, syphilis was the etiological factor concerned in 12.12 per cent. of 99 infant deaths, and was responsible for more deaths than were caused by pregnancy toxaemia, and almost as many deaths as were due to dystocia. It is clear that by encouraging expectant mothers to attend, in the early months of their pregnancy, pre-natal clinics where Wassermann tests are performed as a routine and where antisyphilitic treatment is given when required, a large number of fetal deaths may be prevented. Dr. Whitridge Williams classified 421 patients with positive Wassermann reactions according as they received (1) no treatment; (2) inefficient treatment (two or three injections of salvarsan and no after-treatment); or (3) satisfactory treatment (four to six salvarsan injections followed by a course of mercurial treatment) with the result that the Wassermann test became negative. Of the 157 mothers of Group (1), 52 per cent. gave birth to children born dead or presenting some evidence of syphilis, as compared with 37 per cent. among 103 mothers of Group (2), and 7.4 per cent. among 163 mothers of Group (3).

[1] *Bulletin of the Johns Hopkins Hospital*, May, 1920.

DR. F. W. EDRIDGE-GREEN has been appointed a special examiner in colour vision and eyesight by the Board of Trade.

SIR JAMES MACKENZIE has been appointed an Honorary Physician to His Majesty in Scotland, in the place of Sir Thomas Fraser, who died on January 4th last.

Medical Notes in Parliament.

Work of the Ministry of Health.

DR. ADDISON'S REVIEW OF THE FIRST YEAR.

THE first estimates of the Ministry of Health were presented on July 15th, when Dr. Addison gave a lengthy review of the working of the department during the year. He mentioned that within this period various services had been brought within the Ministry, including those relating to the Insurance Department, the Registrar-General, the work of the Board of Education, in regard to school medical services and prospective mothers, the work of the Home Office under the Children Act, and the Board of Control, which dealt with the whole question of lunacy and mental deficiency. In the same period the Ministry had been able to pass over, in accordance with the provisions of the Act, to other departments a number of services which were foreign to its interests, such as those affecting transport or appertaining more properly to the Board of Education. After paying a warm tribute to Sir Robert Morant, whose death was so greatly deplored, Dr. Addison said that the Ministry had not to any considerable degree incurred the charge of making a permanent increase in the staff. Four sections of the work had required the employment of a large number of people on a temporary basis. The first was the postponed valuation of the approved societies; it would be completed by the end of the year or thereabouts, and would show the soundness of the financial operations of the scheme; in many societies there would be a surplus for disposal in

additional benefits. He was glad also to be able to say as regards routine administration the audits were for the first time in the records of local government up to date. An efficient preventive health service must depend on an adequate supply of trained persons and at present many branches were seriously deficient. A sufficient number of nurses, midwives, etc., could not be produced in the course of a year, and to proceed without a well-thought-out scheme, administered by people who knew what they were wanting to do, would be to spend time and money in vain. Again, any systematic preventive scheme of service must offer fairly full facilities for dealing with early disability, and means for scientific research must at all times be available. The preventive services in this country, so far as they related to the surroundings of individuals, had reached a state of development beyond that of any other. It was largely owing to sanitary service that the health of the people, of whom many dwelt in most pestilential places, was as good as it was.

Housing.

Dealing with the housing question, Dr. Addison said that over 2,000 new houses were inhabited and that another 5,000 or more would be completed within the next month or two. He alluded in some detail to the financial and industrial difficulties which handicapped progress, and then returned to the subject of the prevention of disease.

Typhus, Plague, and Influenza.

One of the first duties of the Ministry of Health at the time of the demobilization of the troops was to organize a sanitary cordon round this country against the introduction of diseases which were devastating Europe. So far the efforts had been remarkably successful. Arrangements had been made with the Treasury to grant to the port sanitary authorities 50 per cent. of their expenses for carrying out this work. As an illustration of the kind of work done, he said that certain cases on board a ship which called at Plymouth were reported as influenza. Fifty persons went on shore and were distributed all over the country. When the vessel reached London the medical officer of the port suspected plague. The trouble started as plague generally did on a ship, amongst the men who had to do with the food. Special arrangements for unloading were made and the cargo was disinfected and isolated. All the crew were inoculated, none having conscientious objections. All the fifty people who had got into the country were traced and no spread of the disease occurred. In the first quarter of 1919 no fewer than 37,000 people, mostly adults in the prime of life, died of influenza—a more severe visitation than for hundreds of years. To guard against the recurrence his department arranged with the Foreign Office to obtain all information from abroad, and organized the experts of other departments, who prepared documents giving information to encourage the people to protect themselves. The Ministry provided also a protective vaccine, of which large numbers of people took advantage. Thanks to the weather and good fortune this country escaped an epidemic last year. Similarly the department took steps, under the advice of Sir David Semple, to deal with cases of rabies that appeared to threaten an epidemic.

Tuberculosis.

More than 2,000 beds had been added to tuberculosis sanatoriums during the year, and grants had been made to 1,000 places for training the men. The treatment of tuberculosis must begin in the home and end in recreating as far as possible a useful unit in the community under healthy conditions, or it would be largely wasteful. A dispensary system had been developed to a certain extent, but nothing would be successful in preventing tubercle, and no sanatorium would wipe out the disease, whilst people had to live crowded in unhealthy dwellings. Inappropriate or insufficient food and bad conditions of life and work were all part of the tuberculosis problem. Training centres must be maintained in connexion with sanatoriums, but although a man might be taught in a sanatorium to be, say, a joiner, it was useless to expect him to enter that occupation as a competitive worker in the ordinary way. Hence had grown up in some places the village colony, and there were one or two standing illustrations, notably in Cambridgeshire, of the successful application of that principle. The men worked at trade union rates of pay and very largely supported themselves. A survey was made of places suitable for village colonies, and the reports were under consideration.

Venereal Disease.

Dr. Addison referred next to what was being done to combat venereal disease, remarking parenthetically that there was no branch of service in which it was more necessary to have a trained personnel. Colonel Harrison, who did brilliant work in the war, and others of experience had joined the staff of the Ministry to help in organizing the service. The number of persons attending the centres had gone up from 460,000 in the first year to 843,000. This meant that people were beginning to recognize the necessity of going to the centres early. The scheme was so far only at the beginning. There was a tendency among certain protagonists to fall upon one another in dealing with the disease. He exhorted them to fall on the disease; in some branches of social work the best efforts were thwarted by the quarrelling of people who had the same objects in view. He hoped that those willing to help in the campaign would not commit this cardinal error. In giving instructions to the centres as to what they had to do, they had to be careful not to recommend something that could not be applied; otherwise there would be disappointment and the whole enterprise would be stultified. It was essential to recognize that what could be done with 1,000 men under strict military control could not be done with the whole population under no control at all. The conditions were entirely different, and it was necessary to proceed carefully. In anything said or in any instructions given the most private, personal, and intimate concerns of the people were touched. The people were more and more appreciating the centres.

The war had shown that they could cut short a great number of cases that otherwise would develop into mental defect of a permanent kind; and it was necessary in working out plans for the future to provide arrangements to deal with mental cases at an early stage.

Insanity and Mental Deficiency.

The Board of Control, which was now a part of the Ministry, was trying to secure the development of a system for the early treatment of mental disorders, which might make many asylums unnecessary. To develop the work to this end post-graduate courses for medical men had been arranged under various authorities and courses of training for nurses and attendants were being instituted.

Infant Mortality.

In no matter was it more important to have trained personnel than in questions affecting the charge of mothers, hence the importance of maternity and infant welfare homes. The Board of Education had arranged last year to give additional grants for training health visitors, midwives, etc. At present 700 midwives were training. The number of centres had increased from 1,400 to 1,600, and the proportion of the population now reached by these services had been increased during the past year from 55 to 61 per cent.—a substantial increase in the case of the rural population. As to the saving of infantile life Dr. Addison gave some striking figures. At the beginning of this century the infant death rate was about one hundred and fifty (154 in 1900 and 1901). A fall began in 1906, when the rate was 132. In the year 1918 it dropped to 97, and last year to 89. The rates for the last completed year—that was, for the last three-quarters of last year and the first quarter of this year—were only 78, or about half what obtained twenty years ago. These are only index figures, for the children who survived were better nourished; the child death rate for the five-year periods up to 1915 showed a fall from 57 to 37, and this was still going on. It had not, however, yet sufficiently made itself felt in the children who went to school. Of the first 750,000 children examined in the schools last year, 40 per cent. were physically defective. That percentage would drop as the diminished infant mortality rate made itself felt. He was glad to say that the facilities for treatment had improved, and that 69 per cent. of these children had received treatment.

Hospitals.

Dr. Addison went on to speak of the reports of the Medical Advisory Council under Lord Dawson, but was reminded by the Deputy Chairman that he must not discuss in Committee any proposals which involved legislation. Dr. Addison said he appreciated this, and went on to say that the position of voluntary hospitals was a cause of great anxiety. More than half of the hospitals in this country were under the Poor Law. It was necessary that the Ministry should be fully informed on the financial side, and should have a medical and scientific survey of services which were available now, and might be made more available. The position of the voluntary hospitals had been brought to his attention on many occasions. He had met those responsible for their direction, and the present King Edward's Fund had set

aside a quarter of a million for the necessities of the hospitals in London. Other proposals were being worked out. The representatives of the voluntary hospitals who came to the Ministry of Health for conference at first seemed to think that the department was greedy to take hold of these institutions for some purpose of its own. But that was not so. The Ministry had enough responsibility to save it from any temptation of that sort. Many of these institutions were pioneers of efficient service, and it would be a mistake of the first order to seek to interfere with that efficiency. Any scheme the Ministry had put forward would be designed to promote the public utility of these institutions.

Statistics.

In another matter the Ministry had consolidated services which were of an associative character by making the department of the Registrar-General part of the Ministry of Health services, thus combining all the vital statistics work.

Research.

Finally, Dr. Addison touched on the provision of scientific and medical research, for which the Treasury had made a grant of £125,000, compared with less than £60,000 a few years ago. As an illustration of the value of such work he mentioned that a grant made for research for the prevention of T.N.T. poisoning had practically abolished it. Thus for a few hundred pounds the payment of thousands a week compensation money had been saved. In the Eastern Command work in connexion with heart cases showed a saving of £57,000 in one year. In closing his review Dr. Addison claimed for the department that it was striving to secure a scientific and well directed health service.

Lieut.-Colonel Raw, after referring with pleasure to the prospect that more money would be given to medical research, expressed the hope that Dr. Addison would, by combining and retaining the great voluntary hospitals, and in some way associating the Poor Law infirmaries, many of which were empty and not required by Poor Law patients, be enabled to provide a national scheme of hospitals. He rejoiced at the Minister's statement that they should at all costs encourage the voluntary hospitals, and in no way interfere with their efficiency, but he was quite sure that financial support would have to be given by the State if they were to continue their excellent work, provided on a national basis, and patients might be enabled to pay for what they received. Facilities for the treatment of persons afflicted with temporary mental disorders without certification might save a very large number of people. The suggested treatment should be given in hospitals totally unconnected with a lunatic asylum. He believed that the action that was being taken by the Ministry would enormously limit the amount of tuberculosis. He trusted that Dr. Addison would keep in close association with the Ministry of Agriculture regarding the effort to stamp out tuberculosis among dairy cows, and that the two Ministers would formulate a scheme to provide the public with perfectly pure milk. Sanatorium treatment could not be expected to effect any cures after a few weeks' or months' residence. Permanent centres were wanted where those affected would receive sanatorium treatment and be taught some occupation, and possibly have their wives and children near them. No fewer than 35,000 soldiers and sailors were affected by tuberculosis, and it was a matter of extreme urgency to give these men treatment.

Mr. Grundy referred to the recommendation of the International Conference at Washington last autumn, that "a working woman should not be permitted to work during six weeks following her confinement, that she should have the right to leave her work if she produced a medical certificate stating that her confinement would probably take place within six weeks; and that while she was absent from her work she should be paid benefit sufficient for the full and healthy maintenance of herself and child, either out of public funds or through a system of insurance." Dr. Addison had stated, in reply to a question, that the British official representatives at the Conference had refrained from voting on this question; and that these matters largely affected insurance questions, and were being carefully considered. He wished to know what the Minister proposed to do.

Mr. Barnes stated that the reason the British delegates at the Washington Conference did not vote on the resolution mentioned by the previous speaker was that they had no mandate on the subject.

Mr. Myers said that under the regulations for maternity and infant welfare, if, in the opinion of a health visitor or midwife, a case visited was difficult, she was entitled to call in a doctor. The general opinion was that when a doctor was called in by the official of a local authority, he sent in his bill to the local authority. In the experience of the speaker, the local authority had readily paid, but he was told that in some parts of the country not only did the local authorities refuse to pay, but they called upon the person who had the service to pay, and they had actually gone to the length of appointing an official to go round and collect weekly payments from these people until the responsibility was discharged. If that were so he hoped that the regulations would be insisted upon. Urging the importance of an adequate supply of midwives, Mr. Myers said he understood that since midwives had been required to have the certificate of the Central Midwives Board, and that those who did not hold the certificate should not practise, the number of midwives available had decreased considerably. In conclusion, Mr. Myers urged that dental clinics should be increased, that there should be greater facilities for minor surgical operations, and that the hospitals now under the Poor Law authorities should be brought under other public authorities, and the voluntary hospitals co-ordinated.

Lieut.-Colonel Fremantle drew attention to the great importance of co-ordinating the public health service of London. He was describing its circumstances and various recommendations made, when, under the 11 o'clock rule, the discussion stood adjourned.

Small-pox in Glasgow.—In reply to Mr. R. Young, on July 14th, Mr. Munro gave the following return of cases of small-pox admitted to Belvedere Hospital, Glasgow, since the beginning of the outbreak:

Age Period.	Unvaccinated.		Vaccinated.	
	Cases.	Deaths.	Cases.	Deaths.
Under 10 years	71	16	8	Nil.
Over 10, under 20 ...	12	4	74	2
Over 20.	5	1	182	29
Totals	88	21	264	31

Total cases admitted to Belvedere Hospital ... 352
Total deaths 52

Of the vaccinated cases, 15 had been revaccinated since infancy. Two of these were said to have been revaccinated in 1916, but there was no visible evidence of this.

Excess Profits Duty: Concession as to Charitable Gifts.—In Committee on the Finance Bill, on July 16th, Mr. Chamberlain was pressed to allow a remission of income tax and excess profits duty in respect of gifts to charitable objects, to an amount not exceeding 5 per cent. of the total income of the claimant. It was, said Lieut.-Colonel Guinness, better to concede this than to risk the great danger that the whole cost of many services now performed voluntarily should be thrown on the State. If no other solution were found, the State would have to take over the hospitals. Mr. Chamberlain, in reply, said he could not entertain the request as regards either income tax or super-tax, but he recognized that the excess profits duty was different. That was abnormal and temporary, and might be said to come in direct competition with charitable appeals. He was willing, therefore, to throw a sprat to catch a whale, and to abate something in the hope that it might encourage the great trading concerns to recognize their corporate liability to the communities in which they lived, and might enable directors to persuade their shareholders adequately to recognize the growing responsibility of these great bodies. He should be willing, therefore, to move later a new clause in the following terms: Where, out of the profits of a trade or business, any contribution has been made after the 16th day of July, 1920, to any trust, society, or body of persons in the United Kingdom established solely for the purpose of the relief of the poor, or the sick, or for the advancement of education, or for scientific research, there shall, for the purposes of excess profits duty, be allowed in the computation of the profits of the trade or business arising in the accounting period within which such contribution was made, a deduction in respect of such contribution of an amount not exceeding 5 per cent. of those profits as calculated for the purposes of excess profits duty (before adjustment for increased or decreased capital and before making any deductions under this section), and not exceeding 20 per cent. of the amount of such contribution.

Third London General Hospital.—Mr. Godfrey Locker-Lampson asked, on July 14th, whether, in view of the treatment urgently required for ex-military and other local tuberculous patients, the London County Council was desirous of taking over the completely equipped wards in the ground at the base of the 3rd London General Hospital on their vacation by the military authorities at the end of July; whether the London County Council were prevented from doing so by provisions of the Defence of the Realm Act, under which it was obligatory that these huts should be dismantled and broken up; whether the erection of similar wards elsewhere would cost a sum of not less than £150,000, and what action the Minister of Health proposed to take. Dr. Addison replied that he appreciated very fully the importance of preserving these buildings for the treatment of the civilian population, and he was in communication with the London County Council on the subject.

The Financial Position of the Hospitals.—In a written answer to a question by Major Godfrey Palmer, Dr. Addison said, on July 15th: I have for some time past been giving the most serious consideration to the future of the voluntary hospitals. The situation in London has been relieved by the recent emergency distribution of £250,000 by the King Edward Fund, and the position of the provincial hospitals is generally less serious than in London. The question of State assistance makes many difficult issues, and I am anxious to avoid any precipitate measures which might prejudice the voluntary principle, to the maintenance of which I attach the greatest importance.

The University of London Site.—In a written reply to a question by Mr. Gilbert, Mr. Fisher, on July 14th, stated that the Government's offer of a site of 11½ acres behind the British Museum for new buildings was still under the consideration of the University of London. As the purchase had not yet been actually completed, he was not yet in a position to speak as to the price proposed to be paid for it. The Government had intimated that, when the time came for King's College to move from the Strand to Bloomsbury, it would seek authority to purchase at a fair valuation the buildings at present occupied by King's College in the Strand, and the price so paid would be available towards the cost of the new buildings to be erected for King's College on the Bloomsbury site.

Inebriates in Scotland.—On July 13th Mr. Munro said there was in Scotland one certified inebriate reformatory to which female prisoners might be committed under Section 24 of the Act of 1898. An habitual drunkard might on conviction under that section be detained in a certified inebriate reformatory for a term not exceeding three years. No certified inebriate reformatory for male patients exists at present in Scotland.

Supply of Artificial Limbs.—On the report stage of the War Pensions Bill, which was taken late on July 15th, Mr. Macpherson objected to a proposal to decentralize the arrangements for the supply of artificial limbs. Mainly on the ground that from 30,000 to 40,000 duplicate limbs had to be supplied, and that afterwards the yearly output would be from 7,000 to 8,000. Repairs, however, were being decentralized. The Ministry was at present standardizing limbs, and he trusted that there would be no further delay in the distribution. A new clause moved by Mr. Graham to define the functions of joint disablement committees was negatived on the assurance by Mr. Macpherson that the powers of the disablement committees would be defined by him as soon as possible.

Death from Anthrax in Southwark.—Sir John Baird (Under-Secretary for the Home Department) informed Mr. Gilbert on July 14th that the existing rules as to the employment of men in dealing with hides and skins are to be brought up to date and to be made to apply to all premises under the Factory Act. The matter was raised in the Commons on the verdict of a coroner's jury in the case of a man in Southwark who died from anthrax. He was engaged in a building which was being used temporarily as a warehouse. The precautions recommended by the Home Office were not being observed in this building, though they were being observed in the main building belonging to the firm.

Disabled Men's Outlook.—Major Cope asked, on July 13th, whether the Minister of Labour was aware that there was a large number of men being discharged from hospital with a thirty to forty per cent. disability pension, and certified as fit for light work, who were unable to find employment. Dr. Macnamara replied that he was aware that in a number of cases the physical disabilities of disabled men made it extremely difficult to place them in employment. The national scheme, however, depended upon employers being prepared to make sacrifices in the interests of disabled men by employing men they might not in ordinary circumstances think physically suitable; he hoped that with the extension of the King's Roll many of these disabled men might be absorbed into industry. Up to the present the Ministry had trained 23,640 disabled men; they had in training 24,048; and on their waiting list 22,445. In training men the department always kept in view the prospect of employment.

Casualties in Russia.—In reply to Commander Kenworthy, on July 13th, Mr. Churchill stated the total British and Imperial casualties in North Russia from the date of the armistice with Germany (November 11th, 1918) to the final evacuation. The figures covered the Regular army, Territorial Forces, Canadians, Australians, and Royal Marine Light Infantry. They were as follows: Killed in action and died of wounds, 31 officers and 147 of other ranks; wounded, 44 officers and 361 of other ranks; missing, 14 officers and 61 of other ranks; total, 89 officers and 569 of other ranks. Of the missing, 13 officers and 60 of other ranks had been reported prisoners. One of these had died. The others had been released. The total casualties in all parts of the former Russian Empire, from the date of the armistice until now, occurring within the categories previously named were: Killed in action and died of wounds, 31 officers and 149 other ranks; wounded, 45 officers and 352 other ranks; missing, 28 officers and 90 other ranks; total, 104 officers and 601 other ranks.

Black Sea Hospital Ships.—Replying to Commander Kenworthy, on July 14th, Mr. Long stated that His Majesty's seaplane carrier *Ark Royal* was used in the Black Sea on one occasion for carrying refugees suffering from typhus. Sixteen cases of typhus occurred among the crew and two died. The only hospital ship was not available when the *Ark Royal* was used, and the urgency of evacuation necessitated the use of all available craft. Mr. Long offered assurance as to the present time that the Government had done all in its power to secure that there should be a hospital ship in attendance.

Cost of Poor Law Patients.—Dr. Addison has stated that in the year 1918–19 the average weekly cost per person in receipt of relief in England and Wales was approximately as follows: In infirmaries, 34s. 1d.; in separate schools and other institutions for children, 18s. 2d.; in general institutions, 20s.; domiciliary relief, 5s. 1d.

England and Wales.

THE WELSH TUBERCULOSIS SCHEME.

THE primary object of the visit of the King and Queen to Wales last week was to open two sanatoriums—the one for women and children and the other for men—established by the King Edward VII Welsh National Memorial Association. The first to be visited was the North Wales Sanatorium for Women and Children at Llangwyfan on the slopes of the Vale of Clwyd, a few miles from Denbigh. It consists of fourteen separate blocks providing accommodation for 240 patients. The administrative block in the centre provides offices, a dining hall and kitchen, and reading and writing rooms. There is a children's pavilion and also a surgical block. The plan of the latter—the gift of Miss Davies, daughter of Sir D. S. Davies, M.P., of Denbigh—was settled in consultation with Sir Robert Jones. The block contains three open-air wards, sun room, anaesthetic room, *x*-ray room, operating theatre, plaster room, etc.

Major David Davies, M.P., President of the Association, in an address to Their Majesties, said that the object of the Association, to which the King had granted a Royal Charter in 1912, was the prevention and treatment, and it was hoped eventually the abolition of tuberculosis. Over a quarter of a million sterling in cash and kind had been voluntarily subscribed by the people of Wales, and the movement had enjoyed the generous assistance of the Welsh county councils and Insurance Committees, all of which were represented on the governing body. The King in his reply congratulated Wales on having so well planned an institution amidst such beautiful scenery. The second institution opened was at Pontywal, Talgarth, on an almost equally good site sloping towards the south. It contains 304 beds in eighteen buildings, and for married men bungalow cottages are provided, each containing a living room, parlour, and three bedrooms, with bathroom, etc.

The Royal visit to Wales ended on July 19th, when the King laid the foundation stone of Swansea University College. The King, in reply to an address from the court of governors, said that it was satisfactory to see evidence in Swansea, no less clearly than in other parts of Wales, of the desire for higher education. The scheme for the University College was firmly rooted in the people's earnest desire for education of the highest type. It was not enough for a university to open its doors wide, it must bring opportunities for serious studies to the doors of the people. The realization of the well conceived scheme which had been evolved in Swansea would give the college a genuine university atmosphere. From its first beginning the university movement in Wales had been a popular movement, and the persistence which had brought it through great difficulties to a successful issue was derived from its strong hold upon the imagination of the people of Wales.

LIVERPOOL HOSPITAL FOR CHILDREN.

An interesting pamphlet on the Hospital for the Treatment of Surgical Tuberculosis at Leasowe, in Cheshire, has recently been published. The inception of the scheme is due to the Council of the Invalid Children's Association, which issued a report showing the number of children within the city of Liverpool who were suffering from various forms of surgical tuberculosis, and for whom no hospital accommodation was forthcoming. This report was forwarded in 1912 to the Board of Education, with the result that a hospital-school for children suffering from all forms of tuberculosis other than pulmonary was erected at Leasowe. On July 21st, 1914, the first 100 beds were open for the reception of patients in the institution, which had been brought into existence by a happy combination of voluntary enterprise and State aid. The site of 25 acres is close to the estuary of the Mersey, and abundantly exposed to sunshine and vigorous breezes as they sweep across the Irish sea. The construction of the hospital has been based on the experience of similar institutions elsewhere, and especially on the principles that have guided the erection of the Maritime Hospital, Berck-sur-Mer. All the wards face due south and open on to roomy sun balconies by suitable doors glazed in the upper segment.

The general arrangements were described in our columns by Dr. Hartley Martin, the senior medical officer,

on November 22nd last. The institution now has 200 beds.

A most important feature in the treatment is the combination of school work with the measures adopted for restoration of health. The three and a half hours' tuition has been of great benefit in combating that fretfulness and depression of spirits inseparable from enforced recumbency and restriction of movement. The statistics of the work of the hospital from the date of its opening in July, 1914, to the end of 1919, show that spinal cases were most numerous and that tuberculous disease of the hip-joint follows closely in the number of cases. The percentage of cases of tuberculosis affecting the spine, hip, knee, bones, glands, and peritoneum, in which the disease was arrested and the patients discharged was 78.3 in 1919. The deaths in 1919 were due to amyloid disease in 3 cases, to meningitis in 4, to general tuberculosis in 2, and to zymotic disease in 1. In conclusion, it may be added that the pamphlet sets forth admirably the work that is being carried out in the treatment of surgical tuberculosis, and shows that every endeavour is being made to combat the disease and to add to the comfort and mental health of the children.

Scotland.

EDENHALL HOSPITAL FOR THE LIMBLESS.

PROBABLY Great Britain is the only country among the late belligerents in which the task of fitting artificial limbs was undertaken by voluntary agencies, for all of the chief limb-fitting hospitals in England, Scotland and Wales were started and supported by benevolent private persons. Roehampton Hospital in England, Edenhall and Erskine House in Scotland, and the Prince of Wales Hospital at Cardiff, have conferred great benefits upon the wounded soldier. The final report of Edenhall Hostel, which is now before us, summarizes the good work done between June 1915 and August 1919, and records the winding-up of the undertaking and the transfer of the hostel to the British Red Cross Society for the use of the Ministry of Pensions. The hostel was at first established at Edenhall near Kelso, and afterwards transferred to Musselburgh near Edinburgh. Under the direction of Colonel Cathcart and his assistant medical officers, 1,581 patients have been fitted with artificial limbs of the best available types. These men came at first from all parts of the country, but latterly the hostel was set aside by the War Office for the service of sailors and soldiers domiciled in the east of Scotland.

DECREASE IN INSANITY.

The sixth annual report of the General Board of Control for Scotland, recently issued, shows that on January 1st, 1920, there were 17,580 insane persons of whom the Board had official cognizance. This total is exclusive of insane persons maintained at home, but includes the inmates of training schools for imbecile children not certified under the Mental Deficiency Act. The number of certified persons on January 1st, 1916, was 18,842. The decrease has been continuous since that year; between 1916 and 1917 there was a decrease of 181; between 1917 and 1918 of 536, between 1918 and 1919 of 524, and between 1919 and 1920 of 169. The relatively smaller decrease last year compared with that of the war years seems to indicate that the lesser prevalence of insanity is not going to be maintained. The figures for the last five quinquennial periods are:

Years.	Average number of Registered patients.
1896–1900	14,498
1901–1905	16,146
1906–1910	17,391
1911–1915	18,537
1916–1920	18,132

The average increase for the first four quinquennia was 1,346, but in the last there was a decrease of 405. It may be assumed that but for the war the figures for 1916–1920 would, therefore, have been at least 19,883, instead of 18,132.

The total number of patients admitted to establishments (excluding transfers) during 1919 was 3,619—855 private patients and 2,764 pauper patients—which is 226 more than in the previous year, and 63 more than the average for 1910–1914. The admission rate, which began to decline at the beginning of the war, appears to be resuming its usual rate of increase. Of the admissions, 2,791 were admitted for the first time, which is 219 more than in the preceding year.

Private patients discharged recovered during 1919 numbered 318, which is 66 more than in the previous year. The number of pauper patients discharged recovered was 955, which is 145 more than in the preceding year. The number discharged unrecovered (excluding transfers) amounted to 187 private patients and 282 pauper patients. This is in excess of the average 1910–1914 for private patients, but below the average for pauper patients. The death-rate for private and pauper patients in establishments was 12.1, as compared with 14.6 in the previous year. This decrease is in large measure due to the absence of epidemics, such as influenza, but is still above the average for the five years 1910–1914.

The reports of the Medical Commissioners on their inspection of different establishments show that while economy has been carefully kept in view, the diet is ample and varied. The boarding-out system is a useful adjunct to the care of the insane in institutions: it presents obvious financial advantages, and in suitable cases conduces to the greater happiness of the patients. Local authorities have responded to an appeal to increase the aliment paid for these cases; but there has in fact been a decrease in the number of lunatics in private dwellings.

The number of mental defectives on the Board's register was 1,778, of whom 1,223 were in institutions and 555 under guardianship in private dwellings. By a recent Act the limitation to £20,000 of the Government grant to local authorities for mental defectives has been removed, and in future one-half of the cost of maintenance will be paid from imperial funds. There is need for additional institutional accommodation, and the Board hopes to meet it in part by the combination of district boards of control.

DEATH OF A MEDICAL CENTENARIAN.

In our issue of May 15th it was announced that Dr. James Scarth Spence Logie, the doyen of the medical profession in the British Isles, celebrated his centenary on May 11th, and in the following week we gave a brief note of his career and of the many messages of congratulation that had been sent to him from public bodies and persons, including a congratulatory resolution passed by the Council of the British Medical Association on May 19th. At its meeting on June 28th at Cambridge the Council received from Dr. Logie's family a letter conveying warmest thanks and appreciation to the Council for its congratulations. We much regret to announce that Dr. Logie died at Kirkwall on July 17th. He was by far the oldest medical graduate of the University of Edinburgh, having obtained his M.D. degree in 1842 at the early age of 22, and he settled in practice at Kirkwall seventy-five years ago. His practice extended over the whole of the Orkney Isles, and was conducted under primitive conditions of locomotion that would have worn out any ordinary man, including winter journeys on horseback over rough hill tracks by night and day, and frequent visits to the islands in small sailing boats.

Ireland.

CERTIFICATION FEES FOR SICKNESS BENEFITS UNDER THE INSURANCE ACT.

A DEPUTATION from the Irish Medical Committee, consisting of Dr. J. M. Day, Dr. W. W. Murphy, Dr. R. J. Rowlette, Dr. Hennessy, Irish Medical Secretary, and Mr. C. H. Gick, has on two recent occasions interviewed the Irish Insurance Commissioners with regard to the inadequacy of the remuneration for medical certification of sickness benefits under the Insurance Act in Ireland. At the first interview Sir Joseph Glynn, Chairman of the Irish Insurance Commission, informed the deputation that the Treasury was prepared to increase the grant for medical certification by 25 per cent. on the existing rates in the different insurance areas. The deputation was unanimously of opinion that an increase of 25 per cent. was too small, and would not be accepted by the profession. The deputation urged that an increase proportionate to that given to the panel doctors in Great Britain should be provided for medical certification in Ireland. The Commission undertook to make a further representation to the Treasury for a substantial increase on the amount already offered, and at the second interview the Commission informed the deputation that the Treasury, on further consideration, was now prepared to increase the original grant by 40 per cent., to take effect, as urged by the deputation, from

January 1st, 1920. The Commissioners complained that the Local Medical Committees, with few exceptions, gave them very little assistance when investigating complaints against medical certifiers. The Commission reminded the deputation that it was at the request of the doctors and in their interests that many matters of a medical character were delegated to the committees for investigation in the first instance; and if the Medical Committees persisted in neglecting to discharge the duties agreed to on their behalf by the Irish Medical Committee it would unavoidably mean that, in many instances, complaints should go before the General Medical Council for its decision. The Irish Medical Committee is aware that the Local Medical Committees have failed in most cases to meet regularly to discharge their functions, and fully recognize the consequences to the profession of such neglect. The increased cost of travelling may be urged as an excuse for the serious omissions of the Local Medical Committees. With the object of avoiding unnecessary travelling expenses the deputation suggested to the Commission that the Local Medical Committees should be permitted to appoint subcommittees of three or five members, conveniently resident in each county as regards travelling, to deal with all complaints in the first instance. The Commission stated it was ready to accept the suggestion of the deputation and expressed the hope that the subcommittees would meet when required and deal expeditiously with all complaints. The Commission also expressed the opinion that it would facilitate investigations if the Irish Medical Committee would recommend that the subcommittees should permit officials of approved societies to give evidence at the inquiries. The deputation considered the Commission's request very reasonable and undertook to recommend its adoption by the Irish Medical Committee.

Salaries of Poor Law Medical Officers.

In connexion with the refusal of the Local Government Board to sanction a higher maximal salary than £300 in certain unions, letters have been addressed by their medical officers to the Thomastown (co. Kilkenny) and Balrothery (co. Dublin) boards of guardians. The Thomastown medical officers in their letter to their board stated:

> We keenly appreciate your kindness in inviting our observations on the letter of the Local Government Board, refusing to sanction the increase in our salaries voted by your board. But first we must heartily thank you for your kindness and sense of justice in granting our modest demands in full. For many years we have been notoriously underpaid, yet during all these years the Local Government Board must admit that we discharged our laborious duties faithfully and well. At last, when driven by necessity, and following the example of workers all over the world, we made application to you for something near a living wage, and when you, the representatives of the ratepayers, who are the chief contributors, after due consideration, granted our moderate demands, the Local Government Board comes in and refused to sanction these paltry increases. This is a great hardship. They do not, as far as we know, advance any reason for their decision, and in the absence of any reason we can only look upon their action as a purely arbitrary decision, dictated by a puerile inclination to display their authority, and quite unworthy of any public body. If your board would ask them to reconsider their decision we would be still more indebted to you and, if possible, more grateful.

Dr. May, on behalf of the Balrothery doctors, in his letter to his board said that they felt it a cause of justifiable dissatisfaction that the Local Government Board refused to sanction the scale of salaries granted them by the late board of guardians (reducing them to the scale salary of £250–£300), especially as the Local Government Board had sanctioned a temporary allowance of £50 a year over and above the scale salary of £250 to £300 per annum to medical officers of the Thurles, Trim, and other unions. The doctors cannot see why the scale sanctioned in the above unions should not at least be given to them, especially as the cost of living, always high from proximity to the metropolis, has increased by 25 per cent. since the date of their application (February, 1920). The medical officers appeal to the Local Government Board to treat them at least as well as the medical officers in the above unions.

THERE has recently been an increase in the number of cases of encephalitis lethargica in Amsterdam.

PROFESSOR MAX NEUBURGER of Vienna has been elected an honorary member of the Society of Medical History of Chicago.

Correspondence.

THE BETTER TREATMENT OF FRACTURES.

SIR,—A colleague said to me, "What is the good of going to the B.M.A. meeting?" I replied, "To get an eye-opener." It has been a most enjoyable meeting. The polished grace of Cambridge society, set amidst the delightful old college buildings, will ever remain a treasured memory. It was a privilege to listen to the erudite address of our beloved President, and thinking of his many years of strenuous work one could hardly marvel more at the wisdom of his words than at his wonderful physical vigour. I listened with great interest to Dr. Charles Mayo, to Sir Berkeley Moynihan, to Sir William Thorburn, and to other leaders in surgical thought; but it was Major Sinclair that gave me my eye-opener.

For over twenty years I have from time to time pondered on the problems presented by fractures and I have wondered at the inadequacy of our methods—methods handed down from a past generation to surgeons whose minds were occupied with the development of abdominal surgery and the attainment of aseptic technique. Students of my day were not well instructed in the treatment of fractures. We received a few demonstrations on splints and bandaging on an uninjured subject; and it all seemed so easy. What a contrast is the reality as met with in works and colliery practice—to say nothing of war! In my student days we seldom saw fractures in the wards; they were regarded as uninteresting cases, and were shunted to infirmaries after first aid had been rendered.

A little later it was my duty to report on claimants for compensation for accidents, and I saw many cases of fractured limbs every year that had been treated by competent practitioners; I watched their progress, and I saw the end results. The end results were often far from satisfactory. My experience led me to think that fractures were serious injuries, difficult to treat, and likely to lead to much permanent disability.

As honorary surgeon to a hospital in a large industrial area, where we get very many fractures, I have had the opportunity of testing the efficacy of the textbook methods of treating fractures without operation, and I have spent much time assisting my house-surgeons in the application of these methods. I have not been satisfied with the results; I have been very far from satisfied.

Having read the conclusions of the committee appointed by the British Medical Association to report on the ultimate results obtained in the treatment of fractures with or without operation, and having regard to my own experience, I was persuaded to adopt Lane's methods in 1914. Latterly I have been trying Albee's methods. I am glad to be able to say that hitherto the methods of Lane and of Albee have been followed in my practice without any serious accident. But my feeling is that the methods of Lane and of Albee are much too dangerous and much too expensive for general application. Such methods can only be carried out in a well-equipped operating theatre with a well-trained staff; they are utterly impossible of general application.

Methods of treating fractures are required that can be applied by the general practitioner with safety to the patient and with a prospect of attaining better functional results than hitherto have been attained by the non-operative methods as taught in many medical schools. Even if it were considered advisable to treat all cases of fracture by the methods of Lane or of Albee, it would not be possible with present hospital accommodation so to treat more than a small minority. Operative methods of treating fractures are not suitable for general application. As a *tour de force* by a highly skilled surgeon operating under favourable conditions such methods excite admiration, but they are not for the many.

On the other hand, fractures are so very common and the disabilities caused by fractures are so very great, and the economic consequences of fractures are so very far-reaching, that I think we should in the future pay more attention to the study of fractures than we have in the last twenty or thirty years. The treatment of fractures is one of the most important branches of surgery.

Major Sinclair has made me think thus, his demonstration at Cambridge has focussed many of my random thoughts. The long-neglected methods of that genius,

Hugh Owen Thomas, preserved and brought to the light of day by one of the ablest of modern surgeons, Sir Robert Jones, have been elaborated under the stress of war by Major Sinclair, who can teach us how to use the Thomas splint. The Thomas splint is cheap, it is almost universally applicable, and if we know how to use it, it is highly efficient. But there's the rub! How many of us do know how to use the Thomas splint? I thought I did, until I attended Major Sinclair's demonstration at Cambridge; then I got an eye-opener!

I am so firmly convinced of the potential value from both the surgical and the economic point of view of Major Sinclair's work that I venture to suggest that means should be provided whereby Major Sinclair could tour the provinces for the purpose of giving instruction in the treatment of fractures. Further, I should like to see an account of his work and a description of the details of his methods published in the form of a monograph at an early date.

Major Sinclair's work has opened up the possibility of attaining far better functional results by non-operative methods than have been attained by the non-operative methods usually taught and practised in the past. Major Sinclair's methods are not reactionary, they are progressive, and his methods will save many a patient from undergoing the ordeal of a serious and possibly dangerous operation. His methods should be learned; they can be learned, and they can be applied by any practitioner. His methods are eminently suitable for works and colliery practice, and, if they are adopted by the profession, I venture to predict that they will effect a very considerable reduction in the economic loss due annually to fractures.—I am, etc.,

Swansea, July 11th. WILLIAM L. GRIFFITHS.

FUTURE PROVISION OF MEDICAL SERVICES.

The Poor Law Medical Service.

SIR,—Modern thought in the carrying out of the art and science of medicine and surgery is inclining in some directions towards whole-time service, both in voluntarily supported hospitals and Government ordered institutions.

A. The medical profession is encouraging the whole-time service method by its adoption of team work in voluntary hospitals. The heads of the teams, surgical and medical, with their subordinates, are paid fixed salaries consistent with their relinquishing private practice and giving their whole time to their hospital.

B. Boards of guardians, without interference from the Ministry of Health, are increasing the number of their infirmary resident whole-time medical officers, and giving them duties of outdoor home attendances—work hitherto done by local district medical officers. For example, half the work of the large Lambeth Union (that is, its first four relief districts) is performed by resident infirmary medical officers. In Fulham the north district is worked from the infirmary; as also is one of the four districts in Shoreditch. In Paddington a scheme has been suggested to dismiss the present four district medical officers for above like purposes. The loophole through which these adverse schemes are being introduced is that many district medical officers have accepted temporary appointments while even whole-life tenure appointments nowadays are less safe than is just. The advantage to be gained, and the success of this line of action, is doubtful, for two reasons at least:

(1) The present areas are so irregular and extensive—for example, Lambeth, from Newington Butts to the Crystal Palace—that the distances to be travelled by any of the infirmary resident medical officers would be enormous in the aggregate, and so would the time occupied unless motor cars and drivers were available both day and night.

(2) The expense would be much heavier than at present, to which ratepayers might well object. The extraordinary economic blindness of some authorities seems wilful. While they refuse fair payment to part-time medical officers, they are ready to pay that which, though right, is yet an increased expense, in order to carry out their pet scheme of whole-time work.

C. Poor Law infirmaries are being opened to the general public for universal use, which, if local medical officers are not watchful, may lead to patients being taken out of their care and treatment. Half the beds—that is, 90,000—in the country are in Poor Law institutions; of this total, 30,000 could be spared for use as general hospitals.

We must oppose this general rush to the infirmary for treatment by the resident staff. The distance to be travelled by the sick to reach this infirmary centre would be an unreasonable tax on them. The part-time medical officer, living in his allotted district, who is not a bird of passage such as whole-time residents generally are, but who gets to know the families around his house in health and sickness, is the ideal custodian of the public health from preventive, actual, and prospective points of view.

How the Poor Law may be Adapted to Present Requirements.

There is, however, a possibility of useful adaptation. The present dispensaries where the district medical officers see their patients daily should be elaborated—*x*-ray apparatus for diagnosis, conveniences for minor surgery, etc., corresponding to the *out-patient* department of hospitals, should be provided for all the sick of a certain area, who should be attended by the local practitioners of that area. Of course, where there are no dispensary buildings, other buildings must be obtained and adapted or new ones built.

Just as there are centres for the treatment of school children so there should be for adults. National Insurance and the present Poor Law work may become one eventually. The *nucleus* for both is already provided by the present Poor Law dispensaries, around which larger activities can be grouped, and by the infirmaries for *indoor* medical treatment. The public will always demand their option to have and pay for their own private practitioner. The part-time Government medical officer will be able to meet their requirements. After minor ailments have been attended to and sifted out at the dispensaries, the severely ill and complicated cases can be sent to the infirmary, where they can be attended by their own district medical officers after consultation with the chief infirmary medical officers and after mutual agreement. The economic question of payment does not affect my present argument.

The further sifting of the different classes of cases is left to the infirmary medical superintendent.

The large circles of recommendations found in the report of the Consultative Medical Council may take years for their accomplishment, but in this adaptation there is a small commencing circle already to hand.

The Ministry of Health will not guide nor take any initiative up to the present. The result is that affairs are getting into confusion, and, as a rule, medical men are the last to be considered and the worst treated by boards of guardians, different plans being adopted in different parts of the country. There are still Poor Law medical officers who have received no war bonus at all, and there are others with bonuses short of the Government-granted standard. This is partly their own fault, as one district medical officer writes to me that his colleagues are lethargic and immovable; they may possibly wake up when it is too late.

At the annual meeting of the Poor Law Medical Officers' Association, held on July 15th, at 429, Strand, with our President, Major-General Sir George J. H. Evatt, K.C.B., in the chair, and a good attendance, the following resolution was proposed and carried unanimously, with instructions to the honorary secretary that it should be sent to the Ministry of Health and to all boards of guardians in England and Wales:

> We, the Poor Law Medical Officers' Association of England and Wales, view with alarm the attempt now being made in some quarters to eliminate *district* medical officers, to the disadvantage, we maintain, of the sick poor, and to place Poor Law treatment into the hands of *whole-time resident* medical officers in the various infirmaries. We consider it inadvisable that changes of this description be made till such time as the whole subject has been carefully considered and the best scheme for the general welfare has been decided upon.

I hope the above will be an eye-opener to some comatose Poor Law medicos; also that no one will waste pen and paper by criticizing my omissions, which are circumferential and purposive, but that all will find in my adaptation of dispensaries (Poor Law and charitable) and of infirmaries backed up by cottage, special, and general hospitals, an

open pathway for advance out of the confusion of waste and incompleteness into graduated order and enveloping efficiency.—I am, etc.,

A. WITHERS GREEN,
Honorary Secretary, Poor Law Medical Officers' Association.

34, Copthall Avenue, E.C.
July 19th.

PROFESSIONAL SECRECY.

SIR,—I ask the courtesy of your columns for the purpose of comment on one aspect of professional secrecy arising out of the discussion at the annual meeting, and reported in the SUPPLEMENT of July 3rd. The subject is of interest not only to the profession but to the public in general, and, as you state, it has attracted a great deal of attention in the newspapers.

It appears, from your editorial on page 2, the Council went fully into the question in 1915, and

was advised that, apart from State officials . . . the only classes of persons recognized by the law courts as competent to claim to hold statements made to them, involving matters of criminal import or otherwise, as absolutely inviolable from obligation to disclose were solicitors and barristers and ministers of religion.

The Portsmouth resolution, which was lost, embodied the view that the medical profession should be placed on the same footing as to professional secrecy with clergy, barristers, and solicitors. The Solicitor to the Association is reported as saying

that protection, so far as professional secrecy was concerned, was practically confined to the Law and the Church. So far as the Church was concerned, the privilege appeared to have gained recognition on sentimental grounds, which were respected by the courts.

It is of first importance, therefore, to inquire into the *quantum* of this protection and privilege which the courts of England are alleged to give to the Law and the Church, and to deny to the profession of medicine. A reference to textbooks on Evidence by writers of repute, and to the *dicta* of the court in reported cases shows that in the case of the Church protection from disclosure is non-existent, and in the case of the Law exists only to a very limited extent.

Perhaps the best exposition on the rule of the court is to be found in the judgement of Jessel, M.R., in Wheeler *v.* Le Marchant [1881], 17 Ch. D. 675, at p. 681:

The principle protecting confidential communications is of a very limited character. It does not protect all confidential communications which a man must necessarily make in order to obtain advice, even when needed for the protection of his life, or of his honour, or of his fortune. There are many communications which, though absolutely necessary because without them the ordinary business of life cannot be carried on, still are not privileged. The communications made to a medical man whose advice is sought by a patient with respect to the probable origin of the disease as to which he is consulted, and which must necessarily be made in order to enable the medical man to advise or to prescribe for the patient, are not protected. Communications made to a priest in the confessional on matters perhaps considered by the penitent to be more important even than his life or his fortune, are not protected. Communications made to a friend with respect to matters of the most delicate nature, on which advice is sought with respect to a man's honour or reputation, are not protected. Therefore it must not be supposed that there is any principle which says that every confidential communication which it is necessary to make in order to carry on the ordinary business of life is protected. The protection is of a very limited character, and in this country is restricted to the obtaining the assistance of lawyers as regards the conduct of litigation or the rights of property. It has never gone beyond the obtaining legal advice and assistance, and all things reasonably necessary in the shape of communication to the legal advisers are protected from production or discovery in order that that legal advice may be obtained safely and sufficiently.

It should be particularly noticed that the privilege is not that of the solicitor, but that of the client himself, who can waive it and consent to the disclosure (Wilson *v.* Rastall, 4 T.R. 754), and further that the privilege extends only to those communications between solicitor and client which are made in the legitimate course of professional employment of the solicitor. Communications made in furtherance of any criminal or fraudulent purpose are not privileged. Thus, in R. *v.* Cox and Railton [1884], L.R. 14, Q.B.D., 153, a solicitor was compelled to disclose what passed between the prisoners and himself on an occasion when they consulted him with reference to drawing up a bill of sale which was alleged to be fraudulent.

So far as the law of England is concerned, medical men are to-day on the same footing as ministers of religion with regard to privilege from disclosure, in any judicial proceeding, of confidential information, though on a less favoured footing than legal advisers. The interest of the State must always be paramount to that of the individual —*salus populi, suprema lex.* Is it desirable on grounds of general or public policy that the privilege of medical advisers should be coextensive with that of legal advisers? In this direction legislation in the British oversea dominions has outstripped the mother country. To give one instance: the State of Victoria (Australia), by Section 28 of the Evidence Act, 1915 (re-enacting provisions of earlier legislation), extends, in wider terms, the privilege of the legal adviser in England to medical practitioners of the State.

No physician or surgeon shall, without the consent of his patient, divulge in any civil suit, action or proceeding (unless the sanity of the patient is the matter in dispute), any information which he has acquired in attending the patient, and which was necessary to enable him to act for the patient.

It has been held by the Supreme Court of Victoria that "information" includes not merely communication, but knowledge acquired through professional observation and examination. Two cases on the enactment are reported, and in each judicial criticism is not wanting. Both were causes on policies of life insurance, and in both the section prevented the insurers producing evidence in support of their defence contesting the claim under the policy.

In the course of the judgement in one case (Warnecke *v.* Equitable Life Assurance Society [1906], V.L.R., 482), the Chief Justice observes:

The point successfully raised in this case gives new and dangerous effect to the section as an obstruction to the administration of justice . . . evidence most important in cases of testamentary or other mental incapacity, in the Divorce Court as to physical condition proving infidelity . . . could not be given in future. For these reasons it seems to me that repeal or amendment of the section is urgently called for in the interests of justice.

—I am, etc.,

ARTHUR W. PEAKE.

South Lodge, Stoke Bishop, Bristol.
July 5th.

THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

SIR,—In connexion with Irish medical affairs there is one matter which requires elucidation and public professional criticism. The point I raise is an explanation as to the reason why candidates for the position of vice-president of the Irish College of Surgeons are allowed to nominate themselves. This is not the system adopted in other colleges, and why it should exist in the Dublin college is more than I can understand. The result is distinctly disappointing, because many of the best and most experienced surgeons in Ireland never get a look in for one of the few distinctions of real value open to the Irish medical, or rather surgical, profession. The duty of nomination should lie, as in England and Scotland, with the Council of the College. Under the present rule aspiring candidates canvass for the position in the most active manner, and are said to go outside their profession and solicit the help of lay friends. If this be true surely it is entirely wrong, and should be rectified without delay. The Fellows of the College cannot have considered this matter carefully, or they would long since have instructed their Council to take immediate steps to remedy a grievance the perpetuation of which has become a scandal. The Council of the College itself requires a little broadening, because it hardly ever opens its doors to anyone living outside the sacred precincts of Dublin.—I am, etc.,

Omagh, July 3rd. EDWARD THOMPSON, F.R.C.S.I.

SIR CLIFFORD ALLBUTT'S PORTRAIT.

SIR,—It has been arranged to issue 100 artist's signed proofs of the mezzotint engraving of the portrait of our President (Sir Clifford Allbutt) at £5 5s. each and the ordinary copies at £1 1s.

They will be ready within the next month, and I shall be glad if members and subscribers requiring a copy will kindly send their names with the necessary remittance to the Financial Secretary, 429, Strand, without delay.—I am, etc.,

G. E. HASLIP,
Treasurer of the Fund.

London, July 19th.

PUBLIC HEALTH SALARIES.

SIR,—In your issue of July 17th, p. 94, Dr. W. Henderson Davison calls attention to what he calls my "fratricidal utterance" on the above subject at the Representative Meeting. The report of what I said is not quite complete, and perhaps if I amplify it Dr. Davison will see that the mark of Cain with which he seeks to brand my words is not applicable.

I think it is deplorable that a large number of men after five to ten years' practice should find themselves in receipt of £500 a year, and accordingly I voted for an increase. I should, however, have liked to see the Representative Body taking some step to prevent the indefinite multiplication of such whole-time junior posts—posts which have nothing to commend them beyond the shelter of a fixed income. The man who takes such a post on becoming qualified adopts the narrowest form of specialism, and cuts himself off from the experience which his studies have just placed him in a position to appreciate. The bulk of the clinical work undertaken by junior public health medical officers could be done better by part-time officers.

Undoubtedly some whole-time men are needed—chiefly as administrators, and the pay of such officials at present is not at all commensurate with the importance of their duties. They should receive better pay, be independent of the local authorities, and should not feel impelled from considerations of self-preservation to encourage blind-alley schemes which have little but their cheapness to commend them.—I am, etc.,

Liverpool, July 20th. F. STRONG HEANEY.

The Services.

INDIAN MEDICAL SERVICE.

THE following is the text of the press communiqué issued from the India Office on July 5th; the text of the letter sent to the British Medical Association on June 22nd is added.

The Secretary of State for India, after consultation with the Government of India, announces the following increased rates of pay for regular officers of the Indian Medical Service, which take effect from 1st January, 1920. The combined rates of basic pay and overseas allowance apply to all officers who were in the permanent service on 1st December, 1918, and to all British officers who have joined or may join the service after that date.

Indian officers who have joined or may join the service after 1st December, 1918, will draw as from 1st January, 1920, pay in accordance with the basic scale set forth below, unless they are already drawing pay at a higher rate, in which case they will continue to enjoy the benefit of that rate for so long as they would otherwise have done; but they will not receive any further increment until it is due to them under the basic scale.

The arrangements affecting Indians who join the service after 1st December, 1918, are provisional. Exchange compensation allowance will not be admissible.

Rank.	Year of Service.	Basic Pay.	Overseas Allowance.	Total Basic Pay and Overseas Allowance.
		Rs.	Rs.	Rs.
Lieutenant	1	500	150	650
,, ...	2	500	150	650
,, ...	3	500	150	650
Captain	4	650	150	800
,, ...	5	650	150	800
,, ...	6	650	150	800
,, ...	7	750	200	950
,, ...	8	750	200	950
,, ...	9	750	200	950
,, ...	10	850	200	1,050
,, ...	11	850	200	1,050
,, ...	12	850	200	1,050
Major	13	950	250	1,200
,, ...	14	950	250	1,200
,, ...	15	950	250	1,200
,, ...	16	1,100	250	1,350
,, ...	17	1,100	250	1,350
,, ...	18	1,100	250	1,350
,, ...	19	1,250	250	1,500
,, ...	20	1,250	250	1,500
Lieutenant-Colonel	21	1,500	250	1,750
,, ...	22	1,500	250	1,750
,, ...	23	1,500	250	1,750
,, ...	24	1,600	250	1,850
,, ...	25	1,600	250	1,850
,, ...	over 25	1,700	250	1,950
,, ...	on selected list	1,850	250	2,100

Charge allowances and second-in-command allowances for station hospitals will be admissible in addition to the above rates of pay at the following rates:

(a) Charge Allowance.

	Rs. per mensem.
1st class hospitals	240
2nd class hospitals	180
3rd class hospitals	120
4th and 5th class hospitals	*nil*

(b) Second-in-Command Allowance.

1st class hospitals	120
2nd class hospitals	90

Dated 5th July, 1920.

The following is the letter referred to:

India Office, Whitehall, S.W.1.
22nd June, 1920.

Sir,

In continuation of this Department's letter of the 5th instant, No. M.4784, I am directed to address you on certain questions affecting the Indian Medical Service. The Secretary of State understands that in the course of interviews which have taken place between the Medical Adviser at the India Office, on the one hand, and the Chairman of the Naval and Military Committee of the Association and the Editor of the BRITISH MEDICAL JOURNAL on the other, the following proposals were put forward on behalf of the service:

(1) *Pay.*—The pay of officers to be calculated on the pre-war scale for charge of a regiment, but to be approximately 50 per cent. in excess of that.

(2) *Allowances.*

(*a*) Allowances to be granted for the charge of Indian station hospitals.

(*b*) Allowances not to be reckoned as part of the 50 per cent. increase, but as additional to it.

(*c*) All existing general allowances paid to holders of professorial and bacteriological appointments, and certain other special classes of appointments on the civil side to be maintained.

(3) *Pensions.*—The same relative consideration to be given to officers of the Indian Medical Service as to combatant officers of the Indian Army. (The maximum for the Director-General, Indian Medical Services, being £1,150 a year.)

(4) *Passages.*—Officers of the Indian Medical Service in military employ to receive the same concessions in the matter of passages as combatant officers of the Indian Army. Officers of the Indian Medical Sevice in civil employ to receive the same treatment as officers of other Civil Services in India.

(5) *Status of the Director-General and Surgeons-General.*—These officers to have the same rights as the Secretary to the Government in the matter of:

(*a*) Direct access to the Viceroy or Governor, as the case may be.

(*b*) Access to documents, and opportunity of forwarding their views to the Viceroy or the Governor, as the case may be.

(6) *Leave Reserve.*—The cadre of the Indian Medical Service to have a reserve of 25 per cent. for furlough, and 2½ per cent. for study leave, whenever this may be practicable.

Points (1) to (3) above have already been disposed of in this Department's letter of the 5th June cited above, and the Secretary of State is about to make a public announcement, communicating the reorganization of the pay of the Service.

As regards pensions, I am to refer you to the memorandum dated 3rd instant issued by this Office, communicating the revised rates of pension for officers of the Indian Army and of the Indian Medical Service.

As regards passages, there has as yet been no decision on the question of passages for combatant officers, but the Secretary of State is willing to undertake that officers of the Indian Medical Service in Military employ will receive the same advantage as those officers, and that those in civil employ will receive such concessions, if any, as may be granted to other officers in civil employ.

The Government of India reported in a dispatch dated 26th February, that they had already agreed to the principle that the Director-General and Surgeons-General with provincial Governments should have the right to place their views direct before the Viceroy or Governor when necessary, and that they were then considering the best means of giving effect to that decision. In the meantime, the Secretary of State accepts point (5).

The Secretary of State undertakes to carry into effect the proposals for a 25 per cent. leave for furlough, and 2½ per cent. reserve for study leave, as soon as the strength of the Service permits.—I am, etc.,

(Sd.) S. F. STEWART,
Deputy Secretary, Military Department.

The Medical Secretary,
British Medical Association, 429, Strand, W.C.2.

SPECIAL GRANTS COMMITTEE: MINISTRY OF PENSIONS.

THE Minister of Pensions announces that the Regulations of the Special Grants Committee have been extended and revised, and that the committee is now in a position to consider applications for supplementary and other allowances from:

1. Officers disabled in the great war—(*a*) in respect of their

wives, up to a maximum of £50 a year; (*b*) in respect of their children up to a maximum of £36 per annum for each child.

2. The widows and dependants of deceased officers of the great war.

3. Nurses belonging to the Imperial Military Nursing Services or other nursing services who have served in the great war and in respect of whom the award of pension has been entrusted to the Minister of Pensions.

The conditions governing the grant of these allowances are shown in the Regulations, which will shortly be on sale and obtainable at any of H.M. Stationery Offices, price 1d. Applications should be addressed to the Secretary, Special Grants Committee (Officers' Section), Millbank House, Westminster, S.W.1.

HONOURS.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following medical officers:

Territorial Force R.A.M.C.—Lieut.-Colonels John W. Leitch, D.S.O. (1st Lowland Field Ambulance) and Matthew Dunning, D.S.O. (2nd Lowland Field Ambulance). Majors Gordon W. Fitzgerald, O.B.E. (1st East Lancs Field Ambulance), Alexander W. French (3rd London—City of London—Field Ambulance), William G. Sutcliffe, O.B.E. (attached 3rd Home Counties Brigade, R.F.A.), John Leach (Highland Mounted Brigade Field Ambulance), Henry G. F. Dawson (attached Welsh Divisional Engineers) and Brownlow Riddell, O.B.E. (3rd Scottish General Hospital). Captain Leonard B. Cane (attached Inns of Court O.T.C.).

Territorial Force Reserve—Army Medical Service.—Colonel William H. Bull, V.D., K.H.S.

FOREIGN DECORATIONS.

The following decorations and medals have been awarded to medical officers by the allied powers for distinguished services rendered during the course of the campaign:

By the President of the French Republic.

Médaille des Epidémies "d'Or": Majors George H. J. Brown, D.S.O., R.A.M.C., George P. A. Bracken, R.A.M.C.; Captains Hyman Lightstone, D.S.O., M.C., R.A.M.C.(T.F.), David Mackie, M.C., R.A.M.C. (S.R.), Charles J. L. Patch, M.C., I.M.S.; Temporary Captains John F. Broughton, M.C., R.A.M.C., Arthur G. Whitehorne-Cole, R.A.M.C., Alexander W. Young, M.C., R.A.M.C.

Médaille des Epidémies "en Bronze": Temporary Captains Harold R. Dew, R.A.M.C., James E. Paterson, R.A.M.C.; Temporary Lieutenant William S. Baird, R.A.M.C.

By the King of Serbia.

Order of St. Sava (4th Class): Major George Ashton, T.D., R.A.M.C.(T.F.).; Temporary Captain Patrick Black, R.A.M.C.

Temporary Captain John Marsters, R.A.M.C., has been appointed O.B.E. (Military Division) in recognition of valuable services in connexion with military operations in South Russia.

The names of the following medical officers have been brought to the notice of the Secretary of State for War for distinguished services rendered with the British military mission in South Russia: Temporary Captain J. M. Mitchell, R.A.M.C., Captain G. P. N. Richardson, R.A.M.C.(S.R.), and Captain (temporary Major) F. C. Tibbs, R.A.M.C.

Among the officers mentioned in dispatches published in a Supplement to the *London Gazette* (June 12th) are Flight Lieutenant Jack Garland Skeet, M.R.C.S., L.R.C.P. (Somaliland), and Wing Commander William Tyrrell, D.S.O., M.C., M.B. (Somaliland).

Dame Maud McCarthy, G.B.E., R.R.C., who was Matron-in-Chief of the British Armies in France throughout the war, has been appointed Matron-in-Chief of the Territorial Force Nursing Service.

DEATHS IN THE SERVICES.

COLONEL ARTHUR WILLIAM PATRICK INMAN, A.M.S. (retired), died at Kingstown on June 17th, aged 66. He was born at Clonmel on May 20th, 1854, the youngest son of the late Captain John Inman, 74th Foot, and educated at Trinity College, Dublin, where he graduated M.B. and Ch.B. in 1878. Entering the army as surgeon on March 6th, 1880, he reached the administrative grade in July, 1905, went on half-pay in August, 1907, and retired in January, 1909, but rejoined on April 1st, 1915, for service in the late war. From August, 1899, to October, 1902, he filled the post of physician and surgeon to the Royal Hospital at Kilmainham.

Lieutenant-Colonel JOHN LANCASTER, Madras Medical Service (retired), died at Streatham on June 9th, aged 70. He was born at Madras on July 5th, 1849, the son of John Lancaster, of Madras. He was educated at Madras University, where he graduated M.B. in 1873. He went to Europe, and took the L.R.C.P. and S.Edin. the same year. He entered the Indian Medical Service as surgeon on March 31st, 1874, became surgeon lieutenant-colonel after twenty years' service, and retired, with an extra compensation pension, on April 1st, 1904. Most of his service was spent in civil employ; for many years he held the civil surgeoncy of Vellore, North Arcot district.

Universities and Colleges.

UNIVERSITY OF OXFORD.

A THEODORE WILLIAMS Scholarship in Pathology has been awarded to D. G. T. K. Cross, St. John's College. The scholarship is tenable for two years, and is of the annual value of £60.

The Gilchrist Studentship for the ensuing year has been awarded to Constance M. Ottley, to assist her in continuing her medical studies in London.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on June 19th the following medical degrees were conferred:

M.D.—N. Gray, J. R. Rees.
M.B.—E. R. Stone.

The following medical degrees were conferred on July 16th:

M.D.—E. M. Brown.
M.B., B.CH.—G. E. Dyas, C. E. Kindersley, C. J. Scholtz.
B.CH.—W. F. R. Castle, Pao T. Liang, B. K. Merson, W. G. Verniquet.

UNIVERSITY OF LONDON.

AT a meeting of the Senate, held on June 23rd, Dr. S. Russell Wells was re-elected Vice-Chancellor for 1920-21.

Appointments.

Mr. H. J. Waring has been elected chairman of the Committee of Medical Members of the Senate for 1920-21.

Dr. S. G. Luker was recognized as a teacher of midwifery and diseases of women at the London Hospital Medical College.

Professor B. J. Collingwood was appointed as from September 1st, 1920, to the University chair of Physiology at St. Mary's Hospital Medical School. The title of Professor of Bacteriology in the University of London has been conferred upon Dr. J. C. G. Ledingham, of the Lister Institute of Preventive Medicine.

It was resolved to institute a University chair of Experimental Pathology tenable at Middlesex Hospital Medical School, and a University readership in Physiological Chemistry at University College.

Regulations for First M.B.

It was resolved that internal students who completed the first examination for medical degrees in March, 1920, should be permitted to present themselves for the second examination, Part I, to be held in July, 1920, provided that they shall have attended approved courses therefor of the prescribed length and otherwise complied with the regulations. Candidates who completed the first examination for medical degrees in March, 1919, or March, 1920, will be permitted to enter respectively for the second examination, Part II, in July, 1920, or July, 1921, as external students, provided that they shall have attended courses of study for the second examination for medical degrees, extending over not less than five terms, and on complying with the regulations in other respects.

Physiological Laboratory.

The annual report of the Physiological Laboratory Committee for the year 1919 was presented. It indicated the scope of the work done, and included a list of papers published.

Brown Institution.

The report of the Superintendent of the Brown Animal Sanatory Institution for 1919 showed that during the year 3,695 animals—including 1,716 dogs, 1,520 cats, and 248 horses—were brought to the institution. The lectures required under the will of the late Mr. Brown were delivered at the Royal College of Surgeons by the Superintendent, who selected as the subject the work of the Base Laboratory, Salonica, in 1916. A number of experiments on influenza had been and were still being carried out in the laboratories for the Medical Research Council. Mr. F. W. Twort was reappointed Superintendent of the Institution for one year as from June 1st, 1920.

Fellowship and Prize.

Applications for the William Julius Mickle Fellowship of the value of at least £200, awarded annually by the Senate, must reach the Principal Officer not later than the first post on October 1st. The award is made to the man or woman who, being resident in London and a graduate of the university, has, in the opinion of the Senate, done most to advance medical art or science within the preceding five years and has therein shown conspicuous merit.

Provided there be a candidate of sufficient merit, a Paul Philip Reitlinger prize of £30 will be awarded on December 3rd, 1920, for the best essay embodying the result of some research work on a medical subject carried out by the candidate. Full particulars can be obtained on application to the Academic Registrar.

Chair of Radiology.

Applications for the University Chair of Radiology, tenable at Middlesex Hospital Medical School (salary £1,000 a year), must be received by the Academic Registrar not later than the first post on September 23rd, 1920.

Course in Mental Deficiency.

Owing to the impossibility of providing accommodation to all applicants for admission to the post-graduate course in mental deficiency, held from May 31st to June 5th, the course will be repeated in the week October 18th to 23rd, 1920.

UNIVERSITY OF MANCHESTER.

THE following candidates have been approved at the examinations indicated:

B.SC. IN PUBLIC HEALTH.—E. N. Ramsbottom.

D.P.H.—*Part II:* W. Ash, Sybil Bailey, J. C. Beckitt, Hilda K. Brade-Birks, J. P. Charnock, W. J. McIvor, C. G. Magee, Kathleen O'Donnell, W. J. A. Quine, A. Renshaw, L. S. Robertson.

UNIVERSITY OF GLASGOW.

THE following were among the degrees conferred on July 19th:

M.D.—*J. G. Wilson, A. B. Hughes, D. MacK. MacRae, J. Young.

M.B., CH.B.—†J. Wyllie, †J. L. Halliday, *W. J. Ferguson, *R. D. Gillespie, *J. L. Anderson, *Helen F. Wingate, *A. G. Smith, *Elsie F. Farquharson, *Margaret L. Johnston, *W. J. Payne, *G. Paterson, Marion B. Armstrong, J. Baird, Annie Barlow, Lillias E. B. Buchanan, A. Campbell, J. G. Campbell, Edith Chalmers, J. L. Cowan, Edith M. Davidson, Simonne Denil (Mrs. Thompson), C. M. Fleming, J. Frew, R. MacI. Gardner, J. A. M. Hall, J. Hurwich, Elizabeth S. Inglis, Isabel E. R. Jeffrey, Anna T. Kellock, W. M. Knox, J. Lavelle, Jane C. Macdonald, R. MacK. M'Kean, Alexandrena M. Maclennan, P. M'Luskie, J. P. M'Millan, P. Macmurray, C. Melville, Janet D. Montgomery, J. Orr, J. Paterson, T. N. Ray, W. H. Scott, J. Smart, D. C. Smith, Mary Steven, Margaret M. Stuart, Helen B. Sutherland, J. N. Tennent, J. R. Turner, Mary C. Walker, D. M. Watson, Mary L. Wilson, Agnes H. N. Young.

* With commendation. † With honours.

UNIVERSITY OF DUBLIN.

TRINITY COLLEGE.

THE following candidates have been approved at the examinations indicated:

FINAL M.B., PART I.—*Materia Medica and Therapeutics, Jurisprudence and Hygiene, Pathology and Bacteriology:* *I. G. Sacks, *C. T. de M. Villet, T. de Bruijn, Olive V. Fair, J. Hofman, R. E. Faussett, M. Elion, I. Cornick, Alice E. Lawlor, May E. Powell, A. Agranat, Ruth F. Flavelle, G. Kirker, Alida C. Burt. *Pathology—completing examination:* P. J. Healy, A. H. N. Todd, T. G. Warham, J. D. Thompson.

PART II.—*Medicine (M.B.):* *E. H. C. Allen, *M. Nurock, W. J. A. Russell, Janie M. Cummins, Olive Baile, F. Z. van der Merwe, Eileen H. Dowse, Doris L. Graham, Essie S. Smyth, W. B. Fox, E. H. Frazer, J. C. Coetzee, F. W. Pienaar, W. R. Burns, F. W. Shegog. *Surgery (B.Ch.):* *E. H. C. Allen, *W. T. Micks, *H. V. Exner, *F. V. Small, *A. J. L. Snyman, *F. Z. van der Merwe, J. H. B. Crosbie, W. J. A. Russell, P. Jabkovitz, J. C. Coetzee, E. H. Frazer, J. P. de Villiers, Moira M. Brown, W. B. J. Pemberton, J. B. Maguire, B. Moshal, M. E. McBrien, F. W. Pienaar. *Midwifery (B.A.O):* Elinor D. Stopford, T. F. L. Cary, W. B. Briggs, F. W. Shegog, C. W. Parr, F. Y. Pratt, E. C. Smith, J. D. Leahy, P. I. Levitt, F. W. Pienaar, R. W. Power, D. V. Latham, M. E. McBrien, Constance McIlrath, Nora Griffith, P. J. Healy, D. J. Browne, J. A. Smith. *Master in Surgery (M.Ch.):* I. W. Corkey.

D.P.H., PART I.—*Bacteriology, Chemistry, Physics, and Meteorology:* Anna M. K. O'Halloran, R. M. Gordon, E. Lipman, J. P. Quinn, Eileen G. Gwynn, J. W. McKinney, Jessie Gilbert, R. E. Tottenham.

PART II.—*Sanitary Engineering, Sanitary Inspection and Report, Hygiene, Epidemiology, Vital Statistics, Public Health Law:* C. H. Comerford, P. Rock, M. J. Graham, A. H. Price, J. F. Gaha, R. M. Gordon, J. W. McKinney, R. E. Tottenham, C. E. Pengelley, C. Kelly.

* Passed on high marks.

Obituary.

SIR JAMES NICHOLAS DICK, K.C.B., Inspector-General of Hospitals and Fleets, R.N. (retired), died at Bembridge, Isle of Wight, on July 12th, aged 89. He was the son of the late George Dick, and took the diploma L.R.C.S.Ed. in 1853. In 1878 he became a licentiate and in the following year a member of the Royal College of Physicians of Ireland. He entered the Royal Navy as assistant surgeon in 1853, and became deputy inspector-general in 1882, when he served as senior officer at the Royal Naval Hospital at Malta. On February 7th, 1884, he was promoted to I.-G., and placed in charge of the Royal Naval Hospital at Haslar, and four years later, in 1888, was appointed Director-General of the Medical Department of the Royal Navy. This post he held for ten years, retiring in 1898. He served in the Crimean war of 1854–56, and in the Abyssinian war in 1868, receiving the medals for these campaigns. He was made K.C.B. on May 25th, 1895, honorary surgeon to the King in 1901, and received a good service pension on January 12th, 1905; and was also a Knight of Grace of the Order of St. John.

YET another Mutiny veteran has passed away. Deputy Surgeon-General WILLIAM ARNOLD SMITH-WYNNE, Madras Medical Service (retired), died at St. Olave's Priory, Suffolk, on July 1st, aged 85. He was born on February 24th, 1835, the son of the late Frederick Parsons Smith, of Aylsham, Norfolk; the late Deputy Surgeon-General Charles Edward Smith, R.A.M.C., who retired in 1886, and died in 1890, was his younger brother. He was educated at St. Bartholomew's Hospital, took the M.D., St. Andrews, and the M.R.C.S. in 1856, and entered the I.M.S. as assistant surgeon on January 29th, 1857. He attained the rank of surgeon-major on July 1st, 1873, and retired on March 21st, 1878, with an honorary step of rank. He took the name of Smith-Wynne soon after. He served in the Indian Mutiny in 1857-58, in the Sagar and Narbada Field Force, in the pursuit of the Bundelcund rebels, and received the medal with clasp. He died suddenly of heart failure while in Herringfleet church, of which he had been warden for over forty years. Deputy Surgeon-General Smith-Wynne's death leaves only two officers of the I.M.S. still living, or shown to be living in the list of retired officers in the *Indian Army List*, who served in the Mutiny, Deputy Surgeons-Generals C. T. Paske and P. W. Sutherland. The *War Office Army List* shows several Crimea and Mutiny veterans of the R.A.M.C. as still living. Sir R. W. Jackson and A. E. T. Longhurst served in both the Crimea and the Mutiny; A. D. Gulland and W. C. Roe in the Crimea; and Sir A. F. Bradshaw, W. G. Don, I. Hoysted, and F. Collins in the Mutiny. Probably there are a few others still alive who served in one or both of these campaigns, and left the army early soon after, so that their names no longer appear in the *Army List*. Obituary notices of two such officers, R. R. Scott and R. G. Burton, have appeared in the JOURNAL within the last few weeks; the names of both had disappeared from the *Army List* about half a century ago.

LIEUT.-COLONEL PHILIP RHYS GRIFFITHS, R.A.M.C. (T.F.), died suddenly at Cardiff railway station on July 13th, aged 63. He was educated at University College Hospital, and took the M.R.C.S. in 1880, and the M.B. and B.S. London in 1881, after which he settled at Cardiff. He was appointed house-surgeon to Cardiff Infirmary, now the King Edward VII Hospital, in 1882, and, after holding that post for two years, went into practice in Cardiff. In 1886 he became assistant surgeon to the hospital, and gradually rose to be senior surgeon, retiring from the regular staff in 1919, when he was appointed consulting surgeon. He was for some years lecturer in physiology and hygiene to University College, Cardiff. He was also consulting surgeon to the Mountain Ash Workmen's Hospital, and to the Great Western Railway, and medical referee to Court Circuit No. 32. He was an ex-president of the Cardiff Medical Society, and a member of the British Medical Association. At the Annual Meeting in 1903 he was vice-president of the Section of Diseases of Children. He was also a member and past-president of the Cardiff Naturalists' Society, and a member of the Cardiff Cymmrodorion Society. In December, 1908, he took a commission as Major in the 3rd Western General Hospital, R.A.M.C. (T.F.), and on June 12th, 1915, was promoted to Lieut.-Colonel.

Medical News.

AMONG the names of the representative women added to the Commission of the Peace on the recommendation of the committee of women appointed by the Lord Chancellor are those of the following medical women: Dr. Ethel Bentham (London), Dr. Janet Lane-Claypon (London), Dr. Mary Scharlieb, C.B.E. (London), Dr. Louisa Martindale (Brighton), and Dr. Helen Mary Wilson (Sheffield).

PROFESSOR SIR JOHN CADMAN, K.C.M.G., D.Sc., University of Birmingham, Mr. W. B. Hardy, Secretary of the Royal Society, and Professor Sydney Young, F.R.S., Trinity College, Dublin, have been appointed members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

WE regret to record the death of Sir Alexander Dempsey, M.D., senior consulting physician and gynaecologist to the Mater Infirmorum Hospital, Belfast, and ex-president of the North of Ireland Branch of the British Medical Association.

A VACATION course of forty-two lectures and demonstrations at the Post-Graduate College, West London Hospital, Hammersmith, will commence on Tuesday, August 3rd, and terminate on Saturday, August 28th. The fee for the course (including one month's hospital practice) is £3 3s., or fourteen days £2 2s., or one week £1 1s. Further particulars can be obtained on application to the Deans at the college.

THE KING OF THE BELGIANS has conferred upon Dr. Francis J. Allan, Medical Officer of Health for Westminster, the Médaille du Roi Albert in recognition of valued services rendered to the Belgian cause during the war.

DR. MUTHU, chief physician of the Mendip Hills Sanatorium, was entertained by some of his old patients at a dinner at the Holborn Restaurant on July 16th, in recognition of his completion of twenty-one years of sanatorium work. They also presented him with an antique silver inkstand as a mark of respect and appreciation.

IN a Chadwick lecture on health conditions in Eastern Europe, Dr. F. Norman White, C.I.E., a medical officer of the Ministry of Health who is acting as a medical commissioner on the Typhus Commission of the League of Nations, said that every country in the world had a very real concern in the conditions of Poland and Russia for economic quite apart from humanitarian reasons. The outbreak of war in 1914 was quickly followed by outbreaks of epidemic disease in Latvia, Esthonia, Lithuania, and the Ukraine, as well as in Poland. Health conditions went from bad to worse, and in 1917 the death rate exceeded the birth rate in every town and district of Poland. Since the armistice there had been little if any amelioration. The strenuous efforts made by Poland to work out her own sanitary salvation entitled her to special consideration.

IT is announced that Dr. Breinl, who has been Director of the Townsville Institute of Tropical Medicine, Queensland, for the last ten years, has resigned the appointment. The committee has recommended the Federal Cabinet to increase the staff of the institute, and to open experimental stations at Port Moresby, Papua, and Rabaul.

THE Royal Statistical Society has opened a register of the names of persons eligible for statistical posts. The Secretary (9, Adelphi Terrace, W.C.2) will be glad to furnish information.

A HUSTLING campaign against tuberculosis is at present being carried on in Finland, where, it is estimated, every hour in the year a human being dies of this disease. The first of March has been chosen as Finland's yearly Tuberculosis Day. This year the church bells were rung to summon the nation to fight "our most devastating national enemy." The press has published numerous articles and notices, and many lectures have been given throughout the country. Students, artists, and many other classes have engaged in most vigorous propaganda, and this year there was not a house in Helsingfors which was not visited by students selling tickets for a lottery by which, with the help of theatrical performances, concerts, balls, and other entertainments, it is hoped to provide the sinews of war.

A CIVIL list pension of £85 has been awarded to Mrs. Goring, the widow of Dr. Charles Goring, author of *The English Convict: A Statistical Study*, which excited wide interest at the time of its publication in 1913.

AN American philanthropist, Mr. Douglas Flattery, has recently presented 100,000 francs to the Bacteriological Institute of Lyons, to endow an annual scholarship to enable a pupil of Lyons University to devote his time to laboratory work on infectious diseases.

ON the initiative of Forssner, Forssel, Holmgren, Key, Quensel and Petren a Swedish Association of Medical Sciences has been established at Stockholm; it has 169 members.

DR. ELIZABETH D. A. COHEN, the first medical woman in New Orleans, has recently celebrated her 100th birthday.

FIVE persons died in Chicago during April and May from anthrax contracted in a curled hair factory.

THE twelfth National Congress of Hydrology, Climatology, and Physical Therapy of the Italian Medical Association will be held at Perugia on October 4th to 8th.

THE Medical School of Guayaquil (Ecuador) has offered a prize of 100 piastres to the schoolmaster who succeeds in training the largest number of ambidextrous pupils.

THE Heubner Prize for the best work on paediatrics has been given to Dr. Arvo Ylppö of Helsingfors, assistant at the Kaiserin-Augusta-Viktoria Haus at Charlottenburg.

TWO cases of rabies occurred in Holland last March, both in the province of Overijssel.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

SENEX inquires whether on the facts stated it is worth his while to claim repayment for 1919–20.

*** The position is as follows:

		£ s. d.
1. Earned income...		193 0 0
Deduct—	£	
Abatement	100	
Wife allowance	50	
Child allowance	40	
Life assurance	3	
	193	0 0
Tax due @ 3s. = Nil.		Nil
2. Unearned income		322 0 0
Less balance of life assurance allowance		40 0 0
		282 0 0
Tax due on £282 @ 3s. 9d. = ...		52 17 6
Tax actually paid on unearned income		53 10 0
Difference claimable		0 12 6

It is perhaps doubtful whether it is worth our correspondent's time to prepare the claim for 12s. 6d., but it may be advisable to preserve the papers so that the claim can be made in the future with the claim for 1920–21 and 1921–22. We assume that he has reckoned the untaxed portion of the £322 on the correct basis—that is, at the amount received in 1918–19.

H. M. C. B. paid income tax during the war on his army pay and on practice takings to the extent of £1,000. He is now charged income tax on the average of his civil earnings and army pay combined. Is this correct?

*** No. The army pay was assessed once and for all as for the year for which it was received, and there is no legal ground for bringing it into the computation of the liability of his present earnings. If the practice was kept in being during the war, he is assessable on the average income during the past three years; if it definitely ceased and has been restarted, he is assessable on the income of the first year after recommencement.

TAXATION inquires whether the Revenue authorities are correct in refusing to accept the basis of cash receipts for his income tax assessment; he was demobilized in March, 1919, and has made his statement on the basis of the cash receipts for the year to March, 1920.

*** It is fairly safe to assume that the cash receipts for that year would not sufficiently indicate the real value of the year's bookings, and primâ facie the authorities are right in demanding a return based on bookings less some allowance for bad debts, and, of course, taking the expenses on a similar footing. "Taxation" does not state whether when he was in the army he paid tax on cash receipts then coming to hand; if he did, then we suggest that he should be allowed to take the cash basis principle now that the circumstances have reversed its application.

C. V. B. bought a practice in October, 1919, and then and since has incurred heavy expenditure on the purchase of two cars—he sold his former car when he was called up in August, 1914. When should his return be made and what can he deduct for motor-car expenses?

*** His liability to income tax for 1920–21 is determinable primarily on the basis of the average profits *of the practice* for

1917, 1918, and 1919, subject to his right to claim an adjustment of the assessment at the end of 1920 if the profits have fallen off from some specific cause since or by reason of his taking over the practice. Accordingly, he should in fact make a return, on an estimate if necessary, on the three-year basis and is not entitled to defer the return for twelve months from the date of taking over. With regard to the motor-car expenditure we consider that he is entitled to deduct, as an expense of the year in which the purchase was made, the then cost of a car of similar power and quality to that which he had formerly, less the £250 which he received when he sold it.

LETTERS, NOTES, ETC.

PROFESSOR W. J. SIMPSON, C.M.G., who was one of the pall bearers at the funeral service of General Gorgas in St. Paul's Cathedral, should have been described in our report as President of the Royal Society of Tropical Medicine and Hygiene.

VENEREAL DISEASES AMONG SEAMEN.

THE International Labour Conference established under the Treaty of Peace, which has been sitting for the past three weeks at Genoa for the purpose of improving by national legislation based on international agreements the lot of the seafaring man, was chiefly concerned with the question of the eight-hour day for seamen. The delegates (who represent the governments, shipowners, and seamen of a score of countries) found time, however, to give attention to the question of the prevention and treatment of venereal diseases. As a result of a meeting arranged by the National Council for Combating Venereal Disease, Mr. C. Hipwood (Assistant Secretary, Board of Trade), one of the British Government delegates, wrote to M. Albert Thomas, Director of the International Labour Office, stating that a strong hope had been expressed that the Conference would take some definite action, and adding that a small committee of representatives of the National Council, seamen, shipowners, and governments had prepared a resolution which an unofficial report states has been adopted by the Conference. It affirmed the importance of active international measures being taken for the prevention and treatment of venereal diseases in the mercantile marine, and recommended:

1. The provision of adequate facilities for the prevention and treatment of venereal diseases at all the principal ports;
2. The inclusion of venereal diseases among the conditions for which "free" drugs and treatment are provided for members of the mercantile marine;
3. The dissemination of appropriate information on the subject to seafarers, especially to those at training establishments; and
4. The provision of adequate facilities for recreation at all large ports, under the administration of joint organizations representative of owners and seafarers.

Special importance was attached to this fourth recommendation.

THE TREATMENT OF MENTAL DISORDER.

DR. HELEN WEBB (London) writes: In a recent short letter which you were kind enough to insert for me in your issue of June 19th, I fear that I did not make myself sufficiently clear. Those for whom detention is necessary and permissible are defined in Section 74 of the Lunacy Act of 1890, as those who can be proved to be "dangerous or unfit to be at large," and according to that Act only the "certified" are under the jurisdiction of the Board of Control. It has lately been proposed to provide homes for "uncertifiable" nervous cases, which shall be run with the co-operation and advice of the Lunacy Board. Such an arrangement will, I contend, be likely to interfere seriously with the prospective usefulness of such homes of recovery. The only class of patients they are meant to benefit are just those who will fear to enter them lest they may later lose their liberty. Homes, on the other hand, free from all connexion with lunacy administration, and from any possibility of detention will inspire confidence in such patients, and be the beginning of a new era in mental therapeutics. Instead of fear and apprehension, such an atmosphere will give that peace of mind which constitutes so large an element in restoring the balance of the patients for whom they will be intended.

PITUITARY EXTRACT IN OBSTETRICS.

DR. ALECK W. BOURNE (London, W.) writes: Will you kindly allow me space to state that in the case of rupture of the uterus recently reported in the BRITISH MEDICAL JOURNAL from a paper I read before the Obstetrical Section of the Royal Society of Medicine I wrongly used the word "pituitrin" to designate the extract of pituitary gland which was employed. It has been pointed out to me that "pituitrin" is the name exclusively used for the product prepared by Parke, Davis and Co., and in this particular case it was not the preparation of this firm which was administered.

JUDGING BABIES.

A CORRESPONDENT inquires as to the different points for which marks should be given in judging infants at baby shows. We learn that the National Baby Week Council, 27A, Cavendish Square, London, W.1, has issued leaflets on this subject, including an article on baby shows and how to judge babies, by Dr. Eric Pritchard, reprinted from *National Health*, and obtainable at the National League for Health, 4, Tavistock Square, W.C.1. Two alternative forms of score sheets for judging babies at mothercraft competitions have also been drawn up by Dr. Pritchard, and copies of these may be obtained by medical practitioners on application to the Secretary of the Council.

THE MEDICAL PROFESSION AND CO-OPERATION.

DR. FERDINAND REES writes: Last week I attended the annual meeting of the Motor Petrol Association, started some years before the war to supply petrol on a co-operative basis. Many members of the profession joined it under the idea that it might be the means of helping them to get out of the clutches of the petrol monopolist. The advent of the war destroyed all our hopes. But, furthermore, the lack of provincial organization rendered the Motor Petrol Association of slight value to doctors living out of London. If only the Wholesale Co-operative Society could have got hold of the Motor Petrol Association and worked it through its retail organization, immense benefits would have accrued to the medical profession. Our hospitals find it very hard to make both ends meet, but no attempt is made by co-operation to supply themselves cheaply with the instruments, drugs, and hospital fittings they require. The public pour in subscriptions, but there is a good deal subtracted by the other hand from that which is given by the one. The Hospitals Association might do more in the way of co-operation than it does at present. The profession needs to learn the lessons of co-operation; in fact, it must if it is to apply the lessons of the Mayo clinic to an organization of healing. That is the great need of the future. "Surgical work in private practice does not pay." Co-operation, especially in country practice, could alter that and keep up the interest in scientific medical work.

LONGEVITY IN SOMERSET.

DR. W. EDELSTEN BRACEY (Wedmore, Somerset) writes: It is somewhat refreshing in these days of hustle and strain to come across long-lived families. I was recently called to a confinement, and in the absence of a nurse my principal assistant was the great-grandmother, ably seconded by the grandmother, the mother having an excellent time in being delivered of a fine healthy boy. Within a few hours I was called to a similar case quite close to the first, this case going even one better, for the midwife in attendance proved to be the baby's great aunt, and was assisted by the grandmother, the great-great-grandfather being packed off to bed out of the way, while the husband and grandfather were despatched by the great aunt to fetch me! It is a matter of some regret to me that the absence in America of the great-grandmother broke the sequence of generations under a single roof that would otherwise have constituted, I fancy, very nearly a record.

ENGINE STARTING.

DR. E. BIDDLE, who writes to us from Guy's Hospital, has, like other drivers, sometimes encountered difficulty in starting a cold engine even in the summer months; since fitting to his car an attachment called the Feuente Starter, which he obtained from Messrs. Prestons of High Holborn, he has always succeeded at the first attempt.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 35, 38, 39, 40, and 41 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 36, 37, and 38.

THE Home Secretary gives notice that he proposes to appoint two additional Medical Referees under the Workmen's Compensation Act, 1906, who must possess surgical qualifications, for the Sheriffdom of Lanark. Applications to the Under Secretary for Scotland, Scottish Office, Whitehall, S.W.1, by August 7th.

THE appointment of certifying factory surgeon at Yarmouth (Norfolk) is vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.

EIGHTY-EIGHTH ANNUAL MEETING
OF THE
British Medical Association.
Held at Cambridge, June 30th to July 2nd.

PROCEEDINGS OF SECTIONS.

SECTION OF MEDICINE.

Sir HUMPHRY D. ROLLESTON, K.C.B., M.D., F.R.C.P., President.

DISCUSSION ON THE PRESENT POSITION OF VITAMINES IN CLINICAL MEDICINE.

OPENING PAPER

BY

F. GOWLAND HOPKINS, F.R.S., D.Sc., F.R.C.P.,
Professor of Biochemistry, University of Cambridge.

THE discussion of this morning is to deal with the effects of certain forms of malnutrition from their clinical aspect, and it is perhaps desirable that as little time as possible should be spent upon reference to the results of experiments upon animals. But though I have been allowed the privilege of opening the discussion, my clinical experience has been extremely small, and I conceive that I am here with a special function. I must perforce speak more or less from the standpoint of an experimentalist.

I regret this necessity the less because I am anxious, before deficiency diseases, as clinical entities, are discussed in detail, to put certain general considerations before you concerning what may be called qualitative under-feeding, considerations which I think may prove of some importance in the more technical discussion.

VITAMINES.

The modern conception of a deficiency disease is not of course based wholly upon a belief in the existence of vitamines. There may be quite other factors of deficiency in a diet which may produce symptoms to be observed clinically; but the hypothesis of vitamine deficiency plays a large part in current views concerning the chief examples of the conditions to be discussed.

The idea of the existence of such substances as those we now call vitamines arose quite inevitably from the fresh facts concerning nutrition which were gathered by means of experiment and observation at about the beginning of the present decade.

There should have been, as I have always maintained, nothing particularly startling about these new facts. It was always an assumption that proteins, fats, carbohydrates, and certain minerals represented the whole nutritional demands of the animal. Directly these constituents of food were fed really pure, it was shown they were not. The only matter for surprise was that certain substances, produced like all others by the plant, should prove so important, though present in so small an amount.

In what I am about to say I refuse to speak of the vitamine "hypothesis." Vitamines, though still of unknown nature in the chemical sense, are not merely hypothetical. In nearly every case that we are to consider, it is, I admit, still a hypothesis that the particular disease depends upon vitamine deficiency, but in respect to the broad aspects of nutrition as a whole, the importance of these factors is proven.

But I have found that there is at the present moment some scepticism concerning the whole question, particularly perhaps among certain members of the medical profession. The fact that I have met it lately in high quarters accounts for the particular direction I am giving to my opening remarks which may seem unnecessarily defensive.

Some of this scepticism has been stimulated by, or is a protest against, quackery—the quackery which always dogs the footsteps of honest scientific work and sound views concerning human nutrition. It is well indeed that the subject we are to discuss should just now be approached critically; but disbelief in the very great importance of qualitative deficiencies in the diet (quantitatively of small moment) in the production of nutritional errors is to be deprecated.

Not long ago, in a professional discussion, a physician whom we all greatly respect and whose authority in such matters is of the highest, spoke of the "vitamine *stunt*." To be just, he was probably applying that much-abused word only to a vitamine hypothesis in the etiology of a particular disease. It was here, according to him, a "stunt," succeeding other stunts which had failed. I felt at the time, however, perhaps wrongly, that the implication was more general. Now, whether deficiency diseases are many or few, and even if it were ultimately shown that in the strictest sense there are none, the conception of vitamines is no stunt. It is based upon experiments as conclusive and as carefully controlled as any in biological science.

Experimental Evidence.

I would like, indeed, to feel that before this discussion proceeds on its more proper lines that some experimental evidence of clear and unequivocal kind should be before the clinical members of this Section, for admonition as it were: evidence which, if they accept the bearings of animal experiments at all, should remove any mere *a priori* disbelief in the importance of small qualitative errors in the food supply. I might do this by presenting a synopsis of a very big literature, but I would prefer to take an illustrative case in the form of some results just obtained in my own laboratory. The particular experiments I refer to were not concerned with any point which is altogether new. They have dealt with the conditions which affect the stability of the so-called fat-soluble vitamine, and the results show definitely that oxidation plays a much larger part in the conditions which destroy it than does temperature. I choose these experiments among the many I might put before you because they illustrate how definite may be the results when the effect of varying a single factor in the diet is studied under fully controlled conditions.

The curves before you represent average body-weight changes in two strictly comparable groups of animals. The two groups were fed side by side upon a dietary absolutely identical in every particular save one. In the food of one set the fat was butter which had been heated for four hours to 120° C.; but heated without aëration. The fat given to the other set was the same butter heated in exactly the same way, but during the heating a stream of air was bubbled through the melted fat. Now, as the curves show, growth in the first set was perfectly normal, while in the case of the second set, though the animals consumed the food satisfactorily, growth continued but for a short time and the animals then steadily lost weight. Shortly after the end of the period covered by the curves (some sixty days) while the first set of animals remained in perfect health all those in the second set were dead. It is easy to show that nothing toxic develops in such aërated fat. Animals taking it in their food after a relatively small amount of normal untreated butter has been mixed with it are maintained in health, and if half of it has been replaced by normal butter they grow well. The butter fat itself is so little altered by the aëration that even the "iodine value" is unchanged. Clearly the treatment has produced some deficiency. That it is legitimate to speak of the effect as one involving a destruction of the fat-soluble vitamine is shown by the fact that the animals fed on the altered butter show just those appearances which are peculiar to others fed upon such vegetable fats as are believed to be free from that substance. This is particularly illustrated by the development of the keratomalacia to which I shall later refer. The crosses placed against the second curve mark the days upon which individual rats developed this eye trouble so characteristic of this particular deficiency. The curves of body weight in the case of individual animals are also before you—it will be seen how little they depart from the mean. The suggestion of the experiments is that the vitamine has considerable heat-stability but that it is easily oxidized, a point of some practical importance.

The animals yielding these very definite experimental results were rats. I ought not to have to defend here the use of that material, though one always has to do so before a lay audience. All students of nutrition have to recognize differences of detail in the response of different species to this or that circumstance, and, like the clinician, they meet with differences even in individuals. But any circumstance which involves absolute failure in the fundamental nutrition of one kind of mammal will most certainly be liable to produce untoward results of some kind in the case of any other mammal. For a biologist to doubt this seems to me almost stupid. Nutritional phenomena are basal phenomena. They differ in detail, but fundamentally they are the same in all animals.

Those who believe in vitamines will doubtless be in a stronger position when the chemical nature of these substances is known, and when they can be administered in a pure condition. Short of that, however, the existence of these accessory factors in nutrition—factors which we can already sufficiently define—is now sure, and needs no further evidence.

While intruding these experimental results upon your notice I do not ask that you should apply them in a discussion of the etiology of any particular disease. I feel only that they, and countless other results of similar import, should remove from any discussion prejudices based merely upon *a priori* disbelief. If small qualitative deficiencies in food can, under any circumstances, produce such startling results, then, assuming that such deficiencies can occur in the food supply of human communities, any preconceptions with regard to their possible causal relations to disease should involve expectancy rather than the reverse. Better of course that the evidence should be viewed without preconceptions, but I find that they unfortunately exist.

General Considerations.

Before dealing with the details I should like to call your attention to still other general considerations.

In connexion with clinical evidence we can seldom expect such clear-cut manifestations as are seen in experiments where only one factor is varied and all others controlled. This consideration is recognized freely enough in connexion with most forms of disease, but somehow it appears to need emphasizing when deficiency diseases are under discussion.

In practice there will be, for instance, only very occasionally, complete absence of any one factor from the diet. Usually the deficiency will be partial only, and often this partial deficiency may involve more than one factor. In conditions such as now exist in Central Europe and the Near East the issues must be considerably confused; specific qualitative deficiencies may be superimposed upon general and quantitative deficiency, and the syndromes thereby altered.

It is most important, indeed, to remember that the absence of a specific factor from the food produces results very different from those that follow actual starvation. In the latter case the energy requirements and other demands are met from the tissues, and there is rigid economy of effort and material. Some harmony, too, among all the processes is secured. But when an individual's diet is deficient in, say, a vitamine, he may still be dealing with large quantities of total food. The metabolic machinery may be working at full pressure while nevertheless deprived of some essential wheel or cog.

Another aspect of these same relations is illustrated in the experimental fact that the necessary vitamine supply is quantitatively not independent of the amount of diet as a whole, nor even of its character. Many possibilities will here occur to the mind of those accustomed to think in terms of metabolism. An excess of carbohydrate in the food, for instance, may apparently exaggerate the effect of a deficiency in the fat-soluble vitamine: not from any added toxic effect, but because it reduces the consumption of body-fat and therefore the mobilization of the store of vitamine which exists in the fat dépôts. This store, if more rapidly mobilized, would secure delay for a time in the effects of the deficiency in the food. On the other hand, the stimulus to metabolism which is brought about by excess of protein might exert in certain cases an influence in the opposite sense. I must not stop to deal with these considerations any further, but I would like to say that to insist upon them as important in connexion with deficiency manifestations is not camouflage but common sense.

Scurvy.

If there be one clinical condition in which the influence of a deficiency seems obvious, direct, and but little complicated, it is certainly scurvy. The manifestations of scurvy seem to me to provide a bridge between the unequivocal results of experiment and the conditions, more complicated and more difficult of interpretation, which must be admitted to exist in some other cases. For surely the evidence that scurvy is a deficiency disease in the strictest sense seems to be wellnigh unequivocal. The historic certainty that it was intimately related to diet only took on a more definite form when the general idea of accessory foodstuffs arose. This extended the conception of specific functions in nutrition: functions which are independent of energy supply. It brought the antiscorbutic factor into a class. Experiment, which has always the advantage over clinical observation in introducing quantitative methods and permitting of controls, has certainly strengthened the evidence. True, one experimenter thought for a while that his results pointed in another direction; but his case has gone, and I gather that he is himself a convert to the more general view. I do not know any more striking evidence to show that the antiscorbutic substance (if there be only one) is of a special nature, coming under the definition (admittedly incomplete, but not vague) of a vitamine, than the fact that while absent from dry grains it appears suddenly when the grains germinate. But evidence for the deficiency hypothesis has, in the case of scurvy, accumulated of late from the laboratory, from the ward, and from the camp. Some may still look to infection as at any rate a secondary factor in its etiology, but I cannot, as I read the evidence, see any reason for this—except an obsession that some sort of positive factor must be called into account for every disease. I take it that the chief evidence in favour of infection in scurvy is the occasional, if very rare, occurrence of what seem to be acute epidemic forms. It is to be hoped that this evidence will be discussed to-day.

Whether or not there are secondary factors in the etiology of the disease, there is, of course, no doubt about the prime importance of the food factor in treatment. Until laboratory investigations were undertaken, there was no satisfactory measure of the relative richness of various foods in the antiscorbutic substance. The recent quantitative studies at the Lister Institute have yielded results of extraordinary importance in this respect, and will put the therapeutics of scurvy upon a really scientific basis. I feel that every clinician should make himself fully familiar with these experimental results.

Beri-beri.

After scurvy, beri-beri is, I imagine, the disease most generally admitted to be due to a dietetic deficiency, though one reads many courageous struggles against the admission. Although I speak with all the grave disqualifications which attach to one who has never seen the disease, I would like to say a word or two concerning certain published discussions about its etiology. One of these happens to serve as well as any other, and I will refer alone to one which I have read with much respect. Major F. M. R. Walshe has written more than one interesting paper on the subject, but I will deal here with an article of his in the *British Journal of Children's Diseases*, vol. xv (1918). The main contention of the author, with which I have no immediate quarrel, is that, in beri-beri, whatever may be the importance of the vitamine deficiency, a disorder in carbohydrate metabolism, introducing a toxic factor, is certainly associated with the deficiency. This was Eijkman's original view, and it is supported by Funk, Braddon and Cooper, and others. It may be true. It is the character of the argument used in support of the contention (I have met the same argument elsewhere) and a certain aspect of the line of thought involved, which awakens my prejudices.

> "It may be asked," writes Major Walshe, "whether a purely *negative* factor such as the absence of a given good constituent or vitamine can be conceived as the sole direct and immediate *cause* of a disease, in which 'polyneuritis, to mention but a single aspect of the disease, is a predominating symptom.'" And again, "*absence* of vitamine cannot be an adequate *cause* of polyneuritis, which is clearly a positive reaction to a direct and positive cause. A carbohydrate metabolism disordered in consequence of this privation might, as we shall see later, conceivably provide this direct and positive cause.
>
> "The neglect of this principle is very evident in all writings on the deficiency theory of the origin of disease, and in the case of beri-beri is the obstacle before which the theory is at present halted. Its application to all presumed deficiency diseases is no less worthy of consideration." (The italics are all in the text.)

I have heard this line of argument so used as to contain nothing but metaphysics, and bad metaphysics at that; but the author I am quoting only means, I think, to point out that an inflammatory tissue-change calls for an

irritant. But is the evidence concerning the nerve lesions in beri-beri such as to show that they are not wholly degenerative? It would not be easy to distinguish a degeneration due to the fact that a tissue cell lacks something necessary to its normal nutritive equilibrium from the degeneration changes due to the chronic influence of a toxin. What is observed in the latter case is, after all, in its ultimate issue, a failure of nutrition. There may be a toxic factor even in typical uncomplicated beri-beri, but without direct evidence for it it seems unnecessary to drag it into etiology by the heels. There is with some, apparently, an inherent difficulty in believing that a "negative" factor in the environment can, in any case, induce a set of symptoms—a difficulty perhaps due to the fact that the study of "positive" causes has hitherto been the chief business of pathology.

Xerophthalmia.

Before making reference to a case of greater clinical importance I would like to say a word or two about the so-called xerophthalmia (better called keratomalacia) which is seen in experimental deficiency feeding. It may have no clinical counterpart. I find that the experiences in Denmark of C. E. Bloch are not universally accepted by clinicians as evidence that it has. But the condition as seen in animals raises some points of general interest.

Two workers in my department, Miss M. Stephenson and Miss B. Clark, have recently studied the histology and bacteriology of the condition as displayed by the rat; and we have lately given it closer attention than before.

It is a late result of feeding animals upon food from which the fat-soluble accessory is absent, being usually delayed (in the rat) till about the fortieth or fiftieth day of the deprivation. Its onset is sudden and is first seen as a corneal opacity. The symptoms develop so rapidly that it is not easy to follow their sequence. Often within a few days from the moment when a small corneal change is first noted there is complete panophthalmitis; the cornea may perforate and the lens extrude.

Caught at an early stage the whole process may, as Osborne and Mendel, E. V. McCollum, and others have stated, be wholly arrested by administering butter, cod-liver oil, or any preparation containing the fat-soluble accessory, though in no other kind of way. The cure is a certain and a striking phenomenon. Protection against the development of the condition is apparently given by a very small supply of the special substance; much less (in the rat) than is necessary to maintain growth. Assuming that there is any possibility of a condition with a similar origin occurring in human beings this last fact might account for its rarity.

While there is no doubt that bacterial invasion plays its part in producing the final condition of panophthalmitis, cultures made from the eyes give no suggestion of a specific infection. The eye trouble never occurs in animals normally fed, nor in others suffering from other kinds of food deficiency, even though they are kept in close contact with animals displaying the condition. There is certainly no doubt that the first and essential stage in the whole process is the appearance of abnormality in the corneal tissue, and everything points to the fact that we have before us an instance of a particular tissue showing an exceptionally low resistance to a specific deficiency. Remembering that the corneal tissue, like cartilage, is non-vascular and lymph-fed, I cannot deny myself a belief in the possibility (though it may be remote) that the facts have some bearing upon the etiology of rickets.

The eye symptoms under discussion may begin so suddenly in a group of animals that, were the circumstances unknown, an epidemic due to specific infection would be suspected. There seems no need to suppose, to judge from the phenomena here observed, that the effect of a food deficiency need be (at least so far as observable symptoms are concerned) a slow and continuous process. The visible failure in this or that tissue may occur suddenly at some critical moment, and in a group of individuals similarly fed it may show itself in many at the same time. This should not be forgotten when the occasional occurrence of what seems an epidemic form is used as evidence that a disease cannot be due to deficiency.

Rickets.

If I now speak of rickets it is with some hesitation and with a sense that the time is not quite ripe for the renewal of a discussion which has so recently been acute. But rickets will doubtless receive attention to-day. Those who believe in the prime importance of defective hygiene in its etiology, and those who at the moment are narrowing down the older dietetic hypothesis to one of a vitamine deficiency, seem both imbued with a firm faith.

Nearly fifteen years ago I myself acquired a bias in favour of a dietetic factor by observing the disease in Venice, where it seemed so frequent in families which, so far as one could discover, never even saw dairy products of any kind. I remain a firm believer in the influence of a specific diet deficiency, at least in experimental rickets as displayed by dogs, because in Dr. and Mrs. Mellanby's experiments I have seen carefully controlled observations showing unequivocal results.

Clinical observations, or, better, so far as they are legitimate, clinical experiments, must doubtless be the final test, and it is clear that great weight must be attached to the recently published work of Drs. Hess and Unger (*Journ. Amer. Med. Assoc.*, 74, 217, 1920), which seem to show that deficiency in the fat-soluble vitamine has little to do with rickets. I trust I have read the account of these experiments without bias. I feel, at any rate, that, though of considerable importance, they fail to set the question at rest. I have not yet seen the results in the statistical form, which would be helpful, and I am struck with the very exceptional constitution of the diet upon which infants were placed when it was intended to create a vitamine deficiency. In respect of the infants developing rickets when upon an apparently normal fat supply no full analysis of the cases is given. A couple of cases only are mentioned in detail. The most striking of these, one in which the child developed rickets upon a very full supply of whole milk, showed at the same time some added abnormality because the generous milk diet (with the addition of spinach) failed to produce growth. It is surely noteworthy that the rickets was cured and growth became normal when at the thirteenth month cod-liver oil was added.

The five children, on the other hand, who did not develop rickets, although their food was presumed to be highly deficient in the fat-soluble vitamine, were given a diet of an extremely high total calorific value, containing, together with a vegetable fat, a very large daily ration of a skim-milk powder. To contrast the nutritive effects of skim milk, fortified with vegetable fat, with those of whole milk, is doubtless a legitimate method of testing the influence of the fat-soluble vitamine so long as both milks are administered in normal amounts. But skim milk is by no means free from the so-called fat-soluble substance. I have experimental evidence to show that highly separated milk contains an amount decidedly in excess of what the residual fat would seem to indicate. When, then, so large an amount as 180 grams of a milk powder, equal to nearly two litres of the original milk, is daily administered, as in Hess and Unger's experiments, to infants aged from four to nine months, the supply of the fat-soluble vitamine is far from being negligible. Valuable as this clinical study may be, I do not think it brings evidence that is final. That more than one factor is concerned in the causation of rickets seems sure. Their relative importance remains yet to be determined.

I find I must not stop to refer to other conditions which are now more or less under suspicion of being deficiency diseases. Others will doubtless discuss them.

Nothing could be more hopeful at the present time than knowledge as to how exactly a given food deficiency acts upon individual tissues, and it is to be hoped that we are to hear, at first hand, some account of Colonel McCarrison's interesting observations. Concerning them I would myself only remark that it would seem to be important to compare the effect of different deficiencies in order to learn what is peculiar to any one.

I have myself seen in animals given a full vitamine supply but deprived of a particular amino-acid—tryptophane, for instance—some effects, especially in the case of various glands, strikingly like those described by Colonel McCarrison.

SIR JAMES BARR, M.D., LL.D., F.R.C.P., F.R.S.E.

FOR anyone in the present day to deliberately say that he does not believe in "vitamines" is tantamount to pronouncing his own anathema maranatha. Be that as it may, I feel that I must approach this subject in a sceptical frame of mind. I believe in accessory food factors, substances which are essential to nutrition and even to life itself, though they have no intrinsic food value of their own. The chemical constitution and physiological effects of such substances are well known, whereas "vitamines," so far as their composition is concerned, seem to be a figment of the imagination.

Sydney Ringer was among the first to discover some of the accessory food factors which are absolutely essential, not only to the maintenance but to the very inception of life. Between 1882 and 1890[1] he performed a series of classic experiments on the physiological effects of the various inorganic constituents of the blood. He showed that for the continuous contraction of the ventricles of the frog's heart the presence of a minute quantity of a calcium salt was absolutely essential. Calcium increases the efficiency of the beat, but delays dilatation.

The effects produced by lime salts in dilatation, and even the persistent spasm induced by the alkaline preparations, are completely removed by a minute trace of a potassium salt, 1 in 10,000 to 15,000.

The ventricles continued to beat perfectly when supplied with a neutral normal saline solution containing minute quantities of calcium and potassium chloride, and therefore alkalinity of the circulating fluid is not necessary for contractility. The alkaline reaction of the blood is no doubt necessary indirectly for contractility, for muscular contractions develop acidity, and this must give an acid reaction to a neutral fluid, and the heart cannot contract when supplied with an acid circulating fluid.

Sodium bicarbonate added to normal saline broadens the beat and rounds its summit, and slightly prolongs both contraction and dilatation. Owing to the increased breadth of the beat, if the contractions be frequent, there occurs partial fusion of the beats. Sodium bicarbonate also induces some persistent spasm (contracture) if the contractions be frequent. All these effects of sodium bicarbonate are obviated by a physiological quantity of potassium chloride.

He showed the antagonism between the potassium and calcium salts, and that the presence of both in proper proportions was necessary for regular and efficient cardiac systoles. He also showed that this antagonism between calcium and potassium existed even in toxic doses, though the antagonism was somewhat modified by temperature, as hot weather caused much tonic contraction which was not entirely obviated by the effects of potassium in hastening dilatation. He found that sodium bicarbonate accelerated dilatation without sustaining the contractility of the ventricle, and of the calcium salts the phosphate was the most efficient. He experimented on fishes, and found that the presence of lime in the water was necessary for the maintenance of life.

I draw attention to the interesting fact that those lime salts most efficacious in sustaining function of cardiac tissue are those best adapted to sustain life in ova and tadpoles; phosphate of lime being far more efficacious than sulphate, and the sulphate somewhat more efficacious than the chloride. It would appear that those salts of lime in which the lime atom is least saturated by the acid are the most capable of sustaining function.

Dr. Ringer, in association with Dr. Dudley Buxton, showed that the effects of the salts of sodium, potassium and calcium on skeletal muscles are somewhat different from their effects on the heart. The contractility of skeletal muscles perfused with normal saline solution lasts longer, but when exhausted there is a great delay in relaxation. The contractions are strengthened and the relaxation delayed by potassium salts; on the other hand, the lime salts accelerate both contraction and relaxation. Personally I have mostly found that patients liable to cramp, especially of the calf muscles, had a deficiency of free calcium ions in their blood, and thus the remainder contraction, so apt to occur in exhausted muscles, is not counteracted by a sufficiency of calcium.

In the present day, when the effects of sodium chloride in the causation of dropsy is so widely recognized, it is worth remembering that Dr. Ringer made experiments on the swelling of laminaria when immersed in water. He found that sodium and potassium chloride retarded but did not lessen the amount of fluid taken up; on the other hand, even minute traces of the chloride or other soluble salt of calcium greatly and persistently restricted the swelling of laminaria. In the treatment of dropsy there should not only be an exclusion of sodium chloride, but a substitution of calcium salts.

The amount of lime salts required for effective cardiac contractions is very small, but the salts must be in free ionizable forms. The more alkaline the blood the less free lime it will hold, and insoluble combinations, such as the carbonate, are readily thrown out of the circulation into the tissues or eliminated by the bowel and kidneys. One of the earliest signs of pneumonia is the great diminution of lime salts in the urine. In cases of advanced arterio-sclerosis I have seen the free lime increased in the blood by putting the patient on a calcium-free diet and administering large doses of phosphoric acid, which set the calcium in the tissues free. There is often an unnecessary quantity of lime salts—you can call them "vitamines" if you prefer—swallowed in drink and food, but fortunately much of this is in insoluble forms, or forms insoluble soaps which are carried off with the faeces. There is also a marvellous provision in Nature whereby the blood does not take up much more than it requires.

In cow's milk there is a huge amount of lime, but fortunately most of it is fixed, and in citrated milk it is not in an ionizable form. On the other hand, in human milk there is not much fixed lime, but there is a relatively large proportion of free ionizable calcium. Long ago I came to the conclusion that it is the fixed lime which is concerned in the viscosity and in the coagulation of the blood; and the free calcium ions are used in muscular contraction. When there is an excess of free calcium ions in the blood the cardiac contractions are apt to become infrequent, slow, but effective, and the left ventricle, owing to its greater muscularity, becomes less irritable than the right; while the rhythmicity of the latter being greater it tends to act in advance, hence we get irregularities, extra-systoles, and intermissions. Of course the potassium and sodium salts play their part.

I would like here to refer to the work of Ralph Mines, whose premature death was a sad blow to scientific medicine. He showed that

the chlorides, nitrates, and sulphates of lanthanum, cerium, and yttrium (unlike those of aluminium) form neutral aqueous solutions. Such solutions added to Ringer's solution made up without alkali will, when perfused through the frog's heart, stop it in diastole when the mixture contains only a hundred-thousandth, or even a millionth gram molecule of the rare earth in a litre. The effect is very slowly removed by washing out with a neutral Ringer's solution, but the beat is instantly restored by the addition of a little alkali. The close parallel between the action of acids and of the salts of the rare earths on an artificial membrane, and their actions on the living heart seem to have a special significance in view of the strong probability that the rhythmic activity of the heart depends on the relations which obtain between the ions within and without the cells.

I saw an experiment in his laboratory where, on cutting the calcium salts out of the nutritive fluid supplied to the isolated heart, the electric variation preceded the contraction of both the auricles and ventricles, and whether the cause or not of the contraction it began the sequence of events, and therefore could not be the result of the contraction.

Dr. Mellanby firmly adheres to the necessity of the fat-soluble A vitamine for the prevention of rickets, and Mrs. Mellanby thinks it necessary for the development of the teeth. Miss Hume seems to hold similar views. Dr. Mellanby found that the deprivation of this factor could not produce rickets in dogs more than four or five months old; carbohydrates appeared to accentuate the rachitic tendency, while proteins and exercise diminished it. In 1914 Braddon and Cooper, and also Funk, published experiments which showed that when fowls or pigeons are fed on polished rice or starch, with or without a fixed amount of the antineuritic "vitamines," polyneuritis comes on sooner if the proportion of carbohydrates in the food be increased.

All these observations are easily explained without invoking any recondite influence of "vitamines." The acid fermentation of an excess of carbohydrates will saturate the free calcium ions, and even dissolve the calcium already deposited in the tissues. On the other

hand, proteins will readily take up a large amount of free acids, and exercise increases calcium metabolism.

In my work on rheumatoid arthritis I showed that an excessive amount of acid, whether taken by the mouth or generated by fermentation of carbohydrates in the stomach, would extract the lime salts from the bones, cartilages, fibrous tissue, and nerves. I have experimentally made my own joints ache and my nerves squirm with a free administration of phosphoric acid. In 1913 Professor W. E. Dixon drew my attention to an article on the pathology of chronic fluorine poisoning, by Dr. Fritz Schwyzer. The enormous increase in the output of calcium could be shown directly in man through the analysis of the urine and faeces, and in animals by determining the specific gravity of the bones.

At a discussion on alimentary toxaemia at the Royal Society of Medicine (May 10th, 1913) Professor Dixon said:

> It is true that under certain conditions a kind of toxaemia may be induced from carbohydrate metabolism; for example, in certain conditions of the bowel an excess of lactic acid may be found, leading to an excess of ammonium salts in the urine and some four or five times the normal excretion of calcium; the result may be calcium starvation, of which one symptom is probably joint trouble.

The water-soluble B vitamine in rice polishings is very stable and not easily destroyed by heat, and it should not be more difficult to isolate this "vitamine" from rice polishings than, say, radium from pitchblende. I am not a professional chemist, but I tried to find this vitamine. Working in a small way, the only difference which I detected between polished and unpolished rice was that the latter contained a considerable amount of a soluble phosphate of calcium, which would be much more than sufficient for neuro-muscular activity if the free calcium ions were not destroyed by acid fermentation; the potassium and sodium salts would come from other sources.

It is a long time since I first recognized the value of calcium salts in health and disease. Many years ago I pointed out that you can have too much of a good thing, and, while calcium is essential for neuro-muscular activity, if you wish to think quickly, speak quickly, and act quickly, you should not have too much fixed lime in your constitution. On account of the enormous amount of lime contained in milk I have condemned the too free use of that article of diet except for babes and sucklings.

Dr. McCarrison is quite ready to upset a good many of our cherished ideas. He says:

> The oedema of inanition and beri-beri is believed to be initiated by the increased intracapillary pressure which results from the increased production of adrenalin acting in association with malnutrition of the tissues.

If there be one fact better established than another, it is that adrenalin acts on unstriped muscular fibre innervated by the sympathetic. In the capillaries the unstriped muscular fibre and the sympathetic, if present at all, are at the vanishing point, but the arterioles are well supplied both with muscle and nerves. When the arterioles over a large area are contracted the arterial blood pressure is raised, but in the affected arterioles and their capillaries the lateral pressure is diminished and the velocity increased. In such cases there is a rapid fall in the pressure gradient from the arteries to the veins, and the capillary transudate necessarily diminished. On the other hand, in vasomotor paresis, which is supposed to accompany the neuritis of beri-beri—the existence of which Dr. McCarrison seems inclined to deny—there is a gradual fall in the pressure gradient from the aorta to the vena cava, and consequently a high intracapillary pressure with an increased transudate. The greater the intracapillary pressure the greater the amount of the transudate, but the less its density; hence in anasarca the tissue fluid is of a low specific gravity, but in any exudate, such as chilblains, or an inflammatory effusion, the density of the effusion is high.

The late Dr. George Oliver, in his classic work on the tissue lymph circulation published in 1904, described in scientific language the effects of many auxiliary food factors. He arrived at the following conclusions:

1. That the food constituents themselves (proteins, fats, and carbohydrates) do not possess the power of starting the mechanism by which lymph is dispensed to the tissues through the body.
2. That Nature, however, associates with our foodstuff small quantities of very active substances which bring into play that mechanism, though these substances themselves are practically devoid of food value, and that man frequently increases this natural lymph by the use of salt, and beverages containing bodies which also incite the flow of lymph. Such bodies as uric acid, creatin, creatinin, xanthin, glycogen, and sodium chloride, perform an important function in nutrition, for during digestion they act as distributors of lymph to all the tissues—an office which the nutrient constituents themselves (proteins, fats, and carbohydrates) are incapable of discharging.

His description of lymph distributors, which were termed by Heidenhain lymphagogues, would answer very well for "vitamines." Lymphagogues are very numerous, very widely distributed, and include all the ionizable salts of calcium, potassium, and sodium. Iodine is the best stimulant of the thyroid, and on this account alone may be termed a vitamine. The same may be said of HCl, which leads to the formation of secretogen and consequent stimulation of the pancreas. The majority of the endocrine glands would come under this category.

I have a very vivid recollection of a Sunday in June, 1892, which my friend, the late Sir Benjamin Ward Richardson, spent with me in Liverpool. We discussed many food factors, including alcohol. Needless to say, Richardson did not consider the latter an essential. It happened that we were both then working at the subject of hydration. I had previously shown that the precipitation of albumin and other colloids was a matter of dehydration, and the greater the dehydration the greater the difficulty in getting the colloid back into solution. Richardson[2] got Mr. Conroy, of Messrs. Evans, Lescher, and Webb, to carry out some experiments on brain and muscle which he was unable to get done in London. He submitted brain and muscle to a pressure of 2½ tons to the square inch, and found that they were both, like water, practically incompressible. On the other hand, when 4 lb. of fresh muscle from the ox were intimately mixed with 4 oz. of common salt and the whole subjected to the same hydraulic pressure the effect was entirely different: "A reddish fluid percolated easily through the cylinder, and 18 oz. of fluid were extracted without difficulty, leaving behind a compact mass of tough, partially dried or compressed, muscular fibre. The fluid or muscular juice contained 10 per cent. of albumin and, on filtration, allowed almost all the saline substance, with some of the albumin, to pass through the filter."

Richardson came to the conclusion that only for the presence of urea and other soluble salts in the blood it would be impossible to have any excretion of urine. He looked upon the water in the blood and tissues as held in loose combination with the colloids, and the crystalloids were the main factors in causing dehydration; just as Oliver showed their influence in lymph distribution.

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HARRIETTE CHICK, D.Sc.,

Lister Institute.

As a laboratory worker I should in any case feel very diffident about addressing an audience such as this, and feel even more humble for the reason that, during the last nine months in Vienna, I have seen something of practical medicine and have acquired a very wholesome respect for clinical work and investigation. I have discovered for myself that laboratory research is a comparatively simple and easy matter when compared with clinical investigation. And in our present endeavour to discover the part played by accessory factors in clinical medicine, I feel sure we shall need the best united efforts of both the clinician and the laboratory investigator, working together with mutual forbearance and unlimited goodwill.

I propose to leave to my colleague, Dr. Elsie Dalyell, any description of our clinical experiences in Vienna, but it would perhaps be helpful to the discussion if I stated the general principles of nutrition, gleaned from the results of laboratory work with animals, which we took with us as a guide when we set out to study hunger and deficiency diseases in Austria. We considered it to be a proved fact that for satisfactory nutrition of animals the diet must have an adequate calorie value and must contain a sufficient amount of the following constituents:

1. Mineral salts.
2. Carbohydrates.
3. Fats.
4. Protein, adequate in amount and of suitable nature.

5. Water-soluble or antineuritic (anti-beriberi) accessory factor or "vitamine."
6. Fat-soluble accessory factor.
7. Antiscorbutic accessory factor.

We believed that in the young growing mammal growth could be checked by a deficiency in any one of these seven constituents, although an ample supply of the other six were present. We also had evidence showing that definite "deficiency" diseases could be developed in both young and adult after prolonged deprivation of any one of the constituents 4, 5, 6, or 7. Thus, after deprivation of No. 4 we might expect something like pellagra to develop; after deprivation of No. 5, tropical beri-beri or perhaps some other nervous disorder; after deprivation of No. 6, rickets, osteomalacia, hemeralopia, or keratomalacia in infants; after deprivation of No. 7, scurvy.

I must admit that all this is a diagrammatic representation of the facts, and that our clinical observations during the last few months have not grouped themselves with the exactness of the scheme as I have drawn it. But it is true to say that very often our cases did fall naturally into the places we had prepared for them.

There was another general conception we took with us from the laboratory, and this proved to be perhaps the most valuable guide we had. It was the importance of *quantity* when dealing with accessory factors in nutrition. This idea helped us to a solution of many difficult points encountered in our clinical observations. It is not enough, for example, to know that the "fat soluble" accessory factor is present in a diet; there must be enough of it. This factor can be presented in many different animal and vegetable fats, and to obtain an adequate amount of the vitamine the amounts of these fats would have to be different. Almost any fresh vegetable or fruit can be employed as antiscorbutic in a diet, but the minimal amounts necessary for protection from scurvy will be different. May I quote an example? Some children in our charge were getting 50 grams daily of raw apple juice as an antiscorbutic, and to our surprise began to show symptoms of a kind which we had learned to associate with the first onset of scurvy. We had no exact experimental data as to the antiscorbutic value of raw apple juice; we only knew that it was much inferior to the juice of lemons and many other fruits. We substituted 10 grams daily of raw neutralized lemon juice with excellent results.

Our observations in Vienna, then, confirm us in the belief that foodstuffs must not be labelled as containing, or not containing, these factors, but as containing them in different degrees. This is little understood. Even a physician will assure you that an infant gets "plenty of antiscorbutic" material in its diet of cow's milk, but will be unable to say for how long or to what temperature the milk is being heated. You will be told that a child is getting "plenty of milk fat" in its diet, but be unable to ascertain whether it is receiving 20, 30, or 40 grams daily. Our experience during the last few months has led us to believe that a difference between, say, 25 and 30 grams daily may have an important bearing upon the growth and development of an infant.

In Vienna we found large numbers of abnormal and diseased infants and young children, suffering from scurvy, rickets, and delayed growth and development. There was no deterioration in general hygienic conditions to account for this fact, and we attribute it to malnutrition caused by the state of partial famine obtaining in Vienna. The same state of things prevailed in children at home and also in institutions, where no lack of calories could be detected in the diets provided, but a great deficiency in accessory factors. Shortage of animal and other fats was, perhaps, the most marked defect in the diet of the pregnant and nursing mothers. As regards artificially-fed infants, disorganized transport, necessitating the heating of milk once or even twice before delivery, reduced the antiscorbutic value of the fresh milk available, while partial substitution of milk by sugar and cereals caused a diminution of both "fat-soluble" and antiscorbutic accessories in the diet. Severe infantile scurvy was a common occurrence at all times of the year, and rickets was almost universal in infants of nine months and upwards. I will leave Dr. Dalyell to describe some of our attempts to prevent and cure these conditions by supplying accessory factors to the diets.

ELSIE J. DALYELL, M.B. (Beit Memorial Fellow),
Sydney, Australia.

IN our recent work among children in Vienna the following were among the most important features from a medical point of view:

1. An unusual frequency of infantile scurvy, or "Barlow's disease" as it is called in Central Europe. This disorder occurred at all times of the year and in all stages of severity. There were cases showing the severe characteristic symptoms described in all textbooks, as well as many showing no definite symptoms at all beyond general ill health and failure to grow and develop. In these cases the only method of diagnosis lay in observing the effect of adding antiscorbutic material to the diet.

2. Great prevalence of rickets in both breast-fed and artificially-fed children. Marked stigmata of rickets were to be observed at a much earlier age than is usual. In one community, which included many breast-fed infants, rickets was diagnosed in 50 per cent. of the infants at 5 months and in 100 per cent. at 9 months. Accompanying this great increase in general incidence of rickets there was much dwarfism and severe deformity in older children.

3. Marked delay in growth and general development, either with or without the definite appearances of rickets or scurvy.

We confined our attention principally to children in certain institutions where, as the result of much devoted effort, the authorities had succeeded in providing a diet containing adequate calorie value. In these institutions, according to the admirable system still maintained in spite of present difficulties, accurate records are kept of medical history, of the diet, and of the general development of the little inmates. In many cases a study of these records suggested that deficiency of accessory factors in the diet of the child (or of the mother in case of breast-fed infants) might be, at least in part, responsible for the condition. With the co-operation of the authorities we were permitted to try the effect of enriching the diet with accessory factors in cases where it appeared desirable, and we wish to record our thanks to Professor Clemens von Pirquet, University Kinderklinik; to Director Dr. Riether, Landes Zentral Kinderheim, and to Dozent Dr. Moll, Reichsanstalt für Säuglinge, for the facilities afforded us in the institutions under their respective control. The following charts (shown on the screen) illustrate six typical instances selected from a large number, showing the result of adding to the diet antiscorbutic and fat-soluble accessory factors alone or in combination.

Chart 1.—A weight chart showing marked improvement in growth and development of a breast-fed child after addition of 30 grams raw turnip juice and 50 grams of butter daily to the mother's diet. When the treatment

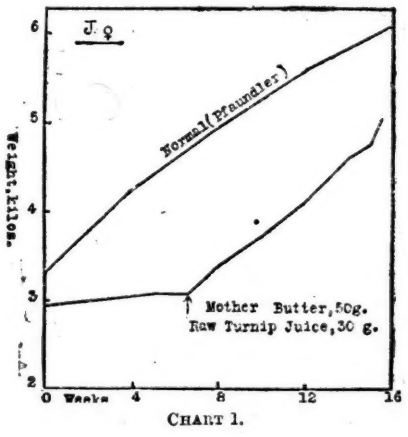

CHART 1.

was begun the child was 6 weeks old, and had put on only 100 grams in weight since birth. There was no increase in the amount of milk secreted by the mother.

Chart 2.—A weight chart showing similar improvement after addition of 20 grams of cod-liver oil daily to the mother's diet. In this case an increase in the mother's milk presumably caused an increase in calories in the child's food. Treatment began when the child was 5 weeks old and weighed less than 3 kilos, having put on no weight since birth. At 22 weeks, after seventeen weeks' treat-

ment, including also some direct administration of cod-liver oil to the child, it weighed 5.7 kilos, the normal weight for this age being about 6.2 kilos.

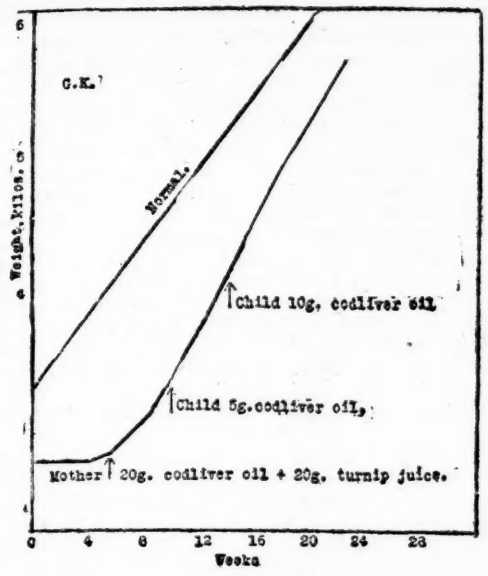

CHART 2.

Chart 3.—The weight chart of an artificially-fed infant of 6 months weighing 3 kilos (4 kilos below the normal), showing great improvement after addition to the diet of 10 grams raw turnip juice and 10 grams (later increased to 20 grams) of butter daily. In this case, owing to other

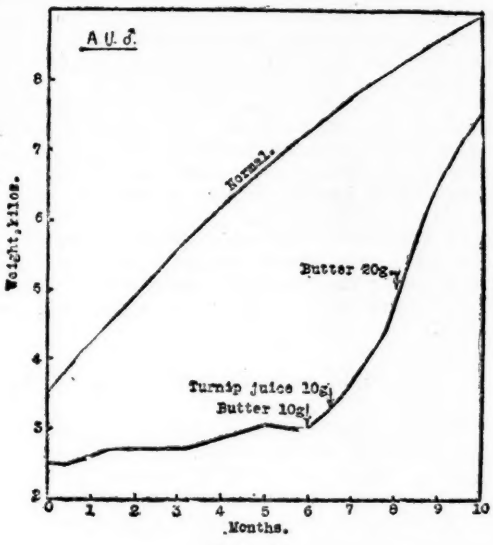

CHART 3.

changes in the diet, the child was receiving actually less calories after, than before, the change. After four months of treatment the child weighed 7½ kilos, and was only 2 kilos below the normal for its age.

Chart 4 shows the weight curves of twins who at 8 months were much below normal development and weighed only 4.2 kilos and 3.5 kilos respectively. Both children had been receiving a diet deficient in milk fat. They improved immediately after addition to the diet of butter and cod-liver oil. The diet of the girl contained previously only 10 to 15 grams daily of milk fat. She was a miserable specimen, undersized, lethargic and pallid (haemoglobin 38 per cent.). At the point marked "Eye" on the curve she developed severe keratomalacia of the left eye, similar to that described by Bloch in Copenhagen. After five days, during which the symptoms became progressively worse in spite of local treatment, she received 10 grams of cod-liver oil emulsion and 20 grams of butter daily, raising her daily fat intake to 35 to 40 grams. She promptly began to improve and to put on weight; in fourteen days the eye was normal, and she had put on 300 grams in weight. She remained under observation for two and a half months, and at the end of the period was a jolly rosy infant weighing 5.6 kilos. The haemoglobin had risen to 70 per cent. At the time the treatment was begun the condition of the boy was rather less miserable. He weighed a little more than the girl, and the fat deprivation in his diet had been less severe. There were

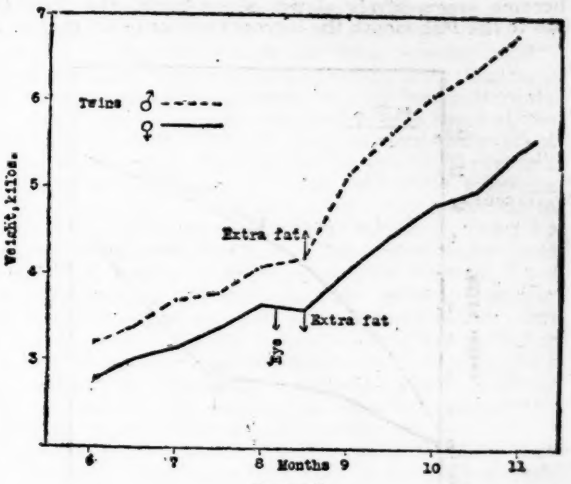

CHART 4.

no eye symptoms. His general improvement after his diet had been adjusted was, if anything, more striking. After two and a half months he had put on 2.8 kilograms and weighed 6.8 kilos. The anaemia had greatly improved. In both cases the additions to the diet involved an increase in calories.

Chart 5.—The weight curves of twins of 2½ years showing the favourable condition of the girl who had received abundant antiscorbutic and fat-soluble vitamine additions to diet during six months, compared with the ill-developed and rachitic state of the boy whose diet had not been so enriched. (This was further illustrated by photographs.) The treated child in this case showed, in addition to the actual increase in weight, the great improvement in general development, intelligence, muscular tone, and texture of the skin which characterized all the previous cases. In this instance lack of antiscorbutic in the diet seems to have been the important factor in retarding growth. The girl had shown

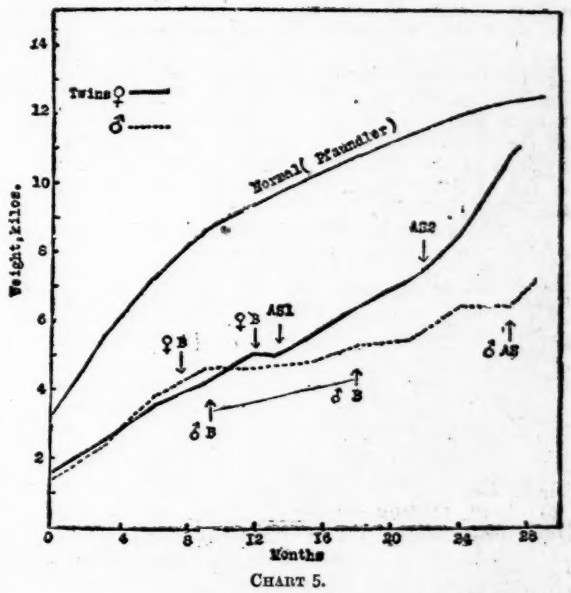

CHART 5.

definite symptoms of Barlow's disease at 8 months and again at 12 months (at points marked B. ♀ on the curve); at 13 months antiscorbutic material was given as raw milk and growth began. At 22 months (at AS 2) more intensive treatment was started by giving raw lemon juice or raw turnip juice, together with butter (10 grams, and later 20 grams), and at 26 months 10 grams cod-liver oil was given as well. The boy had shown definite scurvy at 9 months, and the symptoms had persisted until 18 months, treatment with raw milk proving slow and

ineffective in clearing up the condition; during this period of nine months the child had put on only 1 kilo in weight. The upward kick in his weight-curve at the 27th month corresponded to the addition of lemon juice to the diet.

Chart 6 gives the weight chart of a little girl who at 14 months weighed only 5 kilos. The rate of growth had become progressively slower since birth, and from the 6th to the 14th month the increase was only 500 grams. At

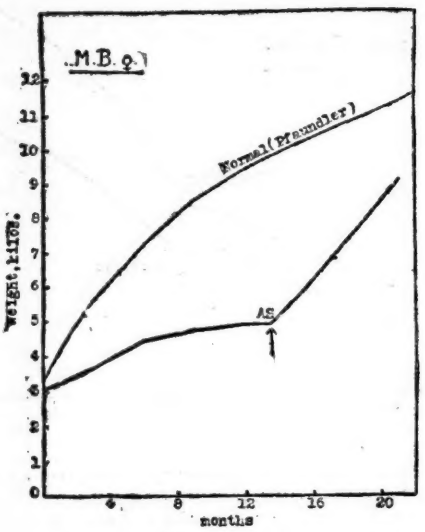

CHART 6.

this point symptoms of scurvy were apparent, and antiscorbutic was introduced into the diet as raw milk. An immediate improvement took place, indicating that the delay in growth during the previous months was to be attributed to lack of antiscorbutic. Raw milk was continued till the 17th month, when the child had put on nearly 2 kilos, and was sufficiently advanced to take a mixed diet.

R. MCCARRISON, M.D., D.Sc., Lieut.-Colonel I.M.S.

BEFORE I proceed to relate my own findings I wish to refer to the subject of keratomalacia mentioned by previous speakers. This affection is common in the Madras Presidency amongst ill-fed Indians whose diet is made up of polished rice, vegetable oils and condiments. I recently saw a number of these cases at the Madras Ophthalmic Hospital where Colonel Kirkpatrick, who has been studying the malady, showed me his beautiful paintings of its various stages. He tells me that his treatment consists in the administration of cod-liver oil, attention to the hygiene of the eye, and a more liberal dietary. So that so far as South India is concerned keratomalacia is not negligible clinically.

Sir James Barr has taken me to task with regard to the explanation of oedema production which I gave in one of my earlier papers on the pathogenesis of deficiency disease. I ventured to offer this explanation in consequence of the observation that oedema in pigeons fed on autoclaved rice was constantly associated with enlargement of the adrenal glands and a corresponding increase of their adrenalin content. He has taken me to task rightly. I was in error, as more extended observation has taught me. My error consisted not in the statement that enlargement with increased adrenalin content of the adrenals occurs in oedematous pigeons fed on autoclaved rice, but in my explanation of the mechanism of oedema production. Yesterday at the Tropical Diseases Section I withdrew this explanation. I do so again. I would claim your indulgence for my error. One must stumble often before one learns to walk.

Yesterday, at the Tropical Diseases Section, I drew attention to the fact that dietetic deficiencies have profound effects on endocrine activity. To-day I have to direct attention to a no less important truth—namely, that "dietetic deficiencies have a profound effect on the digestive organs." Yesterday I emphasized the fact that the effects on the endocrine organs when polished rice formed the basis of the dietaries were due to the action of four factors acting in varying combinations, according to the quality of the deficient food. These factors are:

1. Deficiency of vitamines.
2. Deficiency of suitable protein.
3. Disproportionate values of starch or fat or both.
4. The fortuitous occurrence of pathogenic agents in the body.

To-day I would again emphasize the same fact. When, for example, a dietary such as one composed of autoclaved rice, butter, and onions is used, it is deficient in B vitamine, in suitable protein, and disproportionately rich in starch and fats. The effects of this dietary are thus due not to one defect alone but to three, and there is often superadded to these the action of such pathogenic saprophytes as may happen to be inhabiting the gastro-intestinal tract at the time of the experiment. Now, such a dietary as I have just mentioned is comparable in its composition, and therefore in its effects, to one used largely in this country—namely, a dietary of white bread, margarine, and jam, with a paucity of meat and fresh vegetables. I hold, then, that the effects I have observed in wild monkeys under experimental conditions are applicable in kind if not in degree to the human subject subsisting on such deficient and ill-balanced foods. With your permission, Sir, I shall illustrate these effects on the screen.

[Colonel McCarrison then demonstrated a number of slides on the screen, including those in the special plate published on June 19th last to illustrate his British Medical Association lecture on deficiency disease.] In general, he continued, the symptomatic manifestations of dietetic deficiencies are: (1) Dilatation of the stomach; (2) indigestion; (3) deficient action of the liver and pancreas; (4) air-locks in the small intestine; (5) impairment of the neuro-muscular control of the gastro-intestinal tract; (6) a tendency to intussusception and to the formation of gastric ulcer; and (7), above all, colitis (which in the presence of the specific organism may be a true dysentery). Let me remind you that not every case will present all these symptoms at one and the same time; one part of the digestive apparatus may be more severely affected than another, and thus the predominant symptoms will be those of the organ most seriously affected.

The evidence I have to present is of such a character as to convince me that we have in it an indication of the causation of that great mass of ill-defined gastro-intestinal disorder which throngs our clinics, and concerning which we have hitherto known little or nothing. Clinical experience alone can decide how far I am justified in this belief. I submit that such of my findings as are applicable to the prevention of disease and to the relief of human suffering may forthwith be applied to these ends, while those that may prove to be inapplicable may be discarded.

Professor A. F. HESS, M.D.,
New York.

IT is a great pleasure and privilege to participate in a discussion with so many who have, during the past few years, contributed largely to our knowledge of the vitamines. I was extremely interested to learn from Professor Hopkins's paper that the fat-soluble vitamine is destroyed or greatly diminished by oxidation. Recent experiments with the antiscorbutic vitamine seem to show that this factor also is lessened by oxidation. If milk or neutralized canned tomato juice is shaken for about half an hour, it will be found that it is not as potent as similar material which has not been shaken. This fact may well have practical and clinical importance. In the course of some observations made a few years ago, it was evident that milk pasteurized by simple heating had not lost its potency to nearly the same extent as milk which had been commercially pasteurized for the same length of time and to the same degree. The commercially pasteurized milk undergoes considerable "handling"—it frequently courses through a long series of pipes, is thus agitated while warm, and exposed in a thin surface to the air. A distinction must therefore be drawn between the pasteurization or heating of milk and pasteurized milk; the difference must be borne in mind in interpreting laboratory experiments of this kind. The fact that scurvy made its appearance in France and in Switzerland only when the so-called *lait fixe* or *homogenisé* was introduced—milk which was warmed and then forced

rapidly between metal plates, in order to break up its fat globules—is instructive in this connexion, as illustrating how readily this tissue is damaged by handling.

Dried Milk.

I should like to say a few words concerning dried milk as it is used so extensively in this country, and because I am not quite in accord on this question with some of my English colleagues. In my experience milk may be dried by the well-established Just-Hatmaker process, and nevertheless lose almost none of its antiscorbutic vitamine. As shown years ago by Barlow, one pint of raw cow's milk is required daily to prevent the development of scurvy in an infant. It may be added that about the same amount of human milk from a woman on a liberal and varied diet is needed. In regard to dried milk, Dr. Nuger and myself some time ago cured two cases of scurvy with 3 oz. a day, the equivalent of 24 oz. of fluid milk, and kept the infants on this diet for several months without any recurrence of symptoms. Recently we have cured an infant of scurvy with 2 oz. of dried milk a day, the equivalent of one pint of fluid milk, and this milk has been dried and canned for over six months. The result depends upon the kind of milk used, not only on the process of desiccation but on the nature of milk employed and the manner in which it has been handled. The milk must have been obtained from cows receiving a liberal ration of antiscorbutic fodder, it must have been dried quickly (soon after it was obtained), and then have been well sealed, preferably hermetically. The same individual distinction should be made between dried milks as between other antiscorbutic foods. For example, a vegetable may be rich or poor in the antiscorbutic factor according to whether it is old or young, whether it has been recently plucked or allowed to age. Recent tests have shown that even the degree of maturation is not immaterial—that ripe tomatoes contain more of this vitamine than those which are not completely ripe. It may well be that the soil upon which vegetables grow is also a factor. It is clear, therefore, that it will lead to error if we regard foodstuffs as chemical entities from the standpoint of their vitamine content. The potency of dried milk is of particular interest from a theoretical viewpoint. As you know, the antiscorbutic vitamine is peculiarly susceptible to physical and chemical influences—to heat, drying, ageing, alkalization. But in this instance we find that despite the heating, drying and ageing—in a medium which is neutral or slightly alkaline—the vitamine suffers little deterioration, thus demonstrating that we cannot generalize as to the effect of desiccation or other processes on these elusive unidentified factors.

Rickets and Scurvy.

In turning to the question of rickets, I wish to preface my remarks by stating that the amount of dried skimmed milk employed by Dr. Nuger and myself in the tests cited by the Chairman was 40 to 50 grams, and not 180 grams. I am sorry there should have been an error in this particular. The milk was given diluted ten-fold, which would have made the daily amount 1,800 c.cm. had 180 grams been given, a volume which babies three to six months of age obviously could not consume.

Cases of rickets are rarely diagnosed as scurvy, but I fear that the reverse does not hold true, and that many instances of mild subacute scurvy are regarded as rickets. This is due largely to the fact that beading of the ribs, the well-known "rosary," has been, and is, regarded as a pathognomonic sign of rickets. In point of fact, this sign occurs with great frequency in early scurvy. That the beading, in fact, is scorbutic is evidenced by its yielding to antiscorbutic but not to antirachitic therapy. We have the counterpart of this lesion in guinea-pigs in the so-called "pseudo-rachitic" beading, which has been described so frequently.

One of the most important questions is: What constitutes a rachitic diet; on what food do infants develop rickets? Recently I followed the welfare of a group of institutional infants who for many months received exclusively sweetened condensed milk, averaging about 4 oz. a day, the older children being given cereal in addition. They were about 3 to 12 months of age, were examined carefully each month, radiographed at the same intervals, were weighed daily, and measured every two months. Much to my surprise this supposedly typical rachitic diet produced almost no rickets. In the light of this experience it is difficult to interpret the current opinion as to the rachitic effect of condensed milk. It is quite possible that the changes which in this connexion have been taken for rickets have been those of mild scurvy. Perhaps condensed milk (just as dried milk) may vary in its constituents, and must not be regarded as a uniform product.

The diet which has led to rickets most regularly in the infants under my observation has been "protein milk" (orange juice also being included in the dietary). This milk has been prepared by precipitating the curd from buttermilk by means of heat and then reuniting it with some of the whey, so that the final mixture contains about two parts of curd to one of whey. To this mixture 4 oz. of 20 per cent. cream is added and carbohydrate in the form of a dextrin and malt preparation. This "protein milk" has led to rickets in about 75 per cent. of the babies, as shown by *x*-ray and clinical examinations. The food contains about 3.5 per cent. protein of good quality, 2.6 fat, and 7 per cent. carbohydrate. Its total ash lies midway between that of human and of cow's milk, as does its calcium and its phosphorus content. Its sodium content is even higher than that of cow's milk; its fat-soluble vitamine is sufficient to protect rats, its water-soluble vitamine is low. Further series of tests will be required in order to interpret the underlying cause of this peculiar reaction.

It seems evident from the experiments of Mellanby that the fat-soluble vitamine plays a part in the pathogenesis of rickets, but its part is not as predominant or specific as that of the antiscorbutic vitamine in relation to scurvy. Nor does a lack of adequate protein or an excessive amount of carbohydrate in the dietary explain this difference. There are other important factors which determine whether or not rickets will develop. The inter-relation of the salts seems to play an important rôle. That, however, rickets is primarily a dietetic disorder I firmly believe.

Happily we possess an excellent prophylactic and curative remedy for rickets in cod-liver oil, so that we do not need to stand still but can go straight ahead and protect or cure infants, as if we understood the etiology of the disorder. Cod-liver oil—given in full dosage and not rendered impotent by excessive refining or various additions—is almost a specific. Even at the present time stations can be established in conjunction with child welfare centres, where cod-liver oil can be dispensed, especially in the large industrial cities where this disorder is so rife.

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MEDICINE is indebted to biochemistry (and may I couple therewith the name of Professor Hopkins?) for the extremely important conceptions of the vitamine as an essential factor of health. That certain diseases are due to particular deficiencies in the food has been common knowledge amongst clinicians for at least thirty years. Writing thirty-one years ago Sir Thomas Barlow stated categorically that the cause of infantile scurvy was "a deprivation of fresh food"—in modern phraseology, that it was "a deficiency disease," and he insisted on the need for fresh milk, potato, orange juice, and green vegetables in its treatment, and in regard to adults the same was known much earlier. With reference to rickets, the late Dr. W. B. Cheadle wrote as long ago as 1897: "Of the three elements of food the imperfect supply of which is found to be associated with rickets, fat is probably the most frequently, if not invariably, deficient." The "deficiency disease," therefore, is no new idea, but what is new is the conception that there exists a group of hitherto unrecognized constituents in food—the vitamines—that these play an important part in nutrition, and that certain diseases are due to deficiency of these constituents. Obviously, these propositions are intimately related to clinical medicine, and I believe the biochemists would be the first to admit that their investigation might be greatly helped by the closer co-operation of the clinician.

Perhaps even the problems which the clinician can propound may have value for the laboratory investigator, and I shall venture to mention some in connexion with a disease which has specially interested me, namely, infantile scurvy.

There is an obvious difficulty which meets the clinician constantly in connexion with the etiology of scurvy. An

infant is brought with severe scurvy; he has been fed upon a particular patent food for several months, and it is pointed out to the mother that the patent food has produced this condition. Her immediate reply is, "But I have fed my other children on exactly the same food, and they were perfectly healthy."

Assuming the facts are correct—and so far as I have been able to ascertain they are—what is the explanation? I have none to offer.

Does the infant start with a certain capital, so to speak, of vitamines inherited from his mother—a capital which can be replaced or supplemented only by further introduction of ready-made vitamine from the diet, so that failing any such income the infant lives on its capital and keeps up appearances for a time, but sooner or later becomes bankrupt so far as vitamines are concerned? There would be strict analogy in the behaviour of the thyroidless cretin, who shows no evidence of cretinism at birth, but begins to show symptoms only when he has used up the thyroid secretion which he has inherited with his mother's blood, and this may not be until some months after birth.

If this were so one would expect that when the mother has been taking during pregnancy an ordinary diet containing the average amount of vitamine, a certain more or less fixed period would elapse before symptoms of scurvy would appear in the infant, however scorbutic his diet; and it would be conceivable that if the pregnant mother had lived on a diet very deficient in vitamines—a rare occurrence in this country—her infant fed on a scorbutic diet might develop scurvy at an earlier date than we usually see.

Amongst 116 cases of infantile scurvy which have been under my own observation, the earliest onset was at the age of 5½ months, and there were only three others in which the symptoms appeared as early as 6 months. Out of 100 cases in which the onset could be accurately dated, 80 began between the ages of 6 and 10 months, and 45 began in the eighth or ninth month. Of the 4 cases which began so early as 5½ to 6 months of age, 3 had been fed from birth upon a patent food or condensed milk, and the remaining one had been fed for a few weeks upon a milk mixture, and the remainder of the time upon humanized milk sterilized by superheating.

But I could quote many other cases in which, although the feeding was from birth apparently just as scorbutic, the symptoms of scurvy did not appear till 8, 9, or 10 months of age; and I could mention others again, with feeding equally scorbutic, in which scurvy did not develop at all. Have these infants inherited an unusually liberal supply of vitamines from their mothers? or is it possible that individuals vary so largely in their vitamine requirement that one can eke out a given quantity of capital much longer than another? That there is some such variation of individual requirement of vitamines is suggested by clinical observations on the prophylaxis of infantile scurvy. Professor C. J. Martin states that, according to clinicians, 1 drachm of fruit juice (he is speaking of lemon juice) per diem is "not more than a minimum" prophylactic dose for an infant of 6 months. Amongst my cases of scurvy were several in which much more fruit juice than this had been given regularly for months without preventing the appearance of scurvy. For instance, an infant who had been fed on a patent food (one consisting of dried milk combined with completely malted cereal and prepared by mixing with water) had 3 teaspoonfuls of grape juice daily from the age of 2 months, and at 10 months old developed pronounced scurvy. Another who at the age of 6¾ months showed scurvy, had been fed on a highly scorbutic patent food (one consisting of partially malted cereal combined with an active digestive ferment and prepared by mixing with milk and water), and in addition had had the juice of half an orange, estimated by the mother at nearly 1 oz. daily, since the age of 3 months. Another who at the age of 9¾ months developed scurvy, also on a highly scorbutic food, had been having regularly for months the juice of half an orange one day and ½ oz. of raw meat juice instead on the following day.

Such cases no doubt are exceptional, but I have notes of others like them, and they suggest that some individuals require a larger intake of vitamines than others for the preservation of health.

There is, however, an obvious criticism of this suggestion—namely, that the variation may be in the degree of vitamine deficiency in the diet supplied rather than in the individual receiving it. At present this can only be answered in a general way by the clinical observation of large numbers of cases, which has shown that certain foods figure much more frequently in the history of infantile scurvy than do others; and upon a given food of what I will call "high scorbuticity" one infant will not develop scurvy if a drachm or two of fruit juice is given daily, whereas another on the same food develops scurvy when three or four times this quantity of fruit juice is given. But along with the statement that one to two drachms of fruit juice daily has apparently prevented the onset of scurvy it should be remembered that some infants on an equally scorbutic diet for an equal period do not develop scurvy at all in spite of having no fruit juice or other antiscorbutic.

At present one waits on the biochemist for the possibility of stating the exact value of any particular food in units of vitamine; when we are able to do this we shall have a means of exact clinical investigation and treatment which at present we lack.

There is another possible variant—namely, in the prophylactic itself: are fruit juices or vegetables always equally rich in vitamine? May not the kind of orange, for instance, or its degree of ripeness, or possibly even the soil in which the potato was grown, have some influence on its vitamine content? If vitamines are contained in the blood, and in cattle as well as in man vary in quantity according to the feeding, may not raw meat juice, may not fresh milk itself, vary considerably in its vitamine value? These are all questions to which we clinicians urgently ask for an answer.

There can be little doubt that the degree of scorbuticity—or, if you will, the vitamine deficiency—differs greatly in different infant foods. Judging from clinical experience one would say that some patent foods which are given mixed with fresh milk produce a mixture actually more deficient in vitamines than a dried food which is simply mixed with water. There are, for instance, two well known foods which consist of partially malted cereal and an active ferment, and on being mixed with warm milk the ferment comes into action, so that a digestive process takes place in the preparation of the food; such foods are especially productive of scurvy, although fresh milk is used in the preparation.

Professor Hopkins mentions the destructive effect of oxygenation on vitamines—clinical evidence of this was recognized years ago, when so-called "buddized milk" was introduced. The milk (according to Dr. G. S. Fowler of Edinburgh) was warmed to 122° F., with hydrogen peroxide added: the result being oxygenation of the milk and destruction of bacteria. It was found that milk treated in this way was scorbutic.

The heating of milk just to the boiling point, without prolonging the heating, may diminish but does not apparently altogether destroy its antiscorbutic vitamine so far as can be judged from the fact that although boiled milk is one of the most frequently used foods for infants it figures only rarely in the diet of scurvy (only twice in 64 cases).

It has been generally supposed that the antiscorbutic vitamine is easily destroyed by heat; in curious apparent contradiction of this view is the powerful antiscorbutic effect of potato after being thoroughly cooked. One of the most rapid cures for infantile scurvy is floury baked potato, which is given beaten up with the infant's food. If there is a difference between foods in this respect it may, I would suggest, depend not merely on the amount of vitamine present, but upon the manner in which the vitamine is contained in the food; one can imagine, for instance, that the vitamine may, to borrow a chemical phrase, be in looser combination in one food than in another, and so may be more exposed to destruction by heat.

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IT is very difficult to discuss with patience the views of those—so gently referred to by the opener—who hold that a deficiency cannot give rise to disease. I am neither so patient nor so polite as Dr. Hopkins, and I have no hesitation in saying that such an attitude is both stupid and ignorant. Stupid because it displays a complete lack of imagination, and ignorant because it ignores ascertained and demonstrable facts. Is not myxoedema a deficiency

disease, and Froelich's syndrome, and many another? That the *minus* in these cases happens to be an endocrine *minus* instead of a dietetic, makes no difference to the general principle that the lack of defensive essence is just as potent a producer of disease as the presence of an invading toxin. I am indeed here to carry this argument a step further by declaring that all disease—or nearly all—depends not so much upon the presence of a *plus* as upon the absence of the *minus;* to contend that were it not for the poverty of the soil in defensive essences the weeds of disease would never grow. That these defensive essences are supplied by the vitamines, whether acting directly upon metabolism or indirectly as hormones, I cannot see any reason to doubt.

Let us take a broad view of the question and state the problem in some such terms as these: Here is a community of civilized individuals whose members to the extent of about 85 per cent. suffer chronically, from the cradle to the grave, from diseases and disorders of the bucco-gastro-intestinal tract. They suffer from dental caries, adenoids and tonsils, dyspepsias, pancreatic and hepatic disorders, appendicitis and constipation, and the long tract is dotted and punctuated with malignant disease. What is the cause? Now, if I were to state this problem to anyone present or to anyone with any scientific training I venture to say that his instant reply would be "Inquire into the dietetic habits of this community, and correct some error which must be staring you in the face."

Now, I said that the community was civilized, and I want to emphasize that word. I ought perhaps to say hypercivilized. At any rate the community has travelled far from its primitive state, the state in which it knew not the cooking stove, the state in which it subsisted upon fruits and roots and herbs in their natural conditions, the state of animal and physiological efficiency which enabled it to evolve from brute beasts which had no understanding to the condition of being possessors of the earth and everything that's in it.

Now if we know anything of vitamines we know them to be contained in uncooked foods and absent relatively from cooked. And we know, too, that our community lives upon a diet from which uncooked foods are carefully excluded. They boil their milk, they steam their vegetables, they stew their fruits. And they do these things from a combination of fear and pleasure. Against the pleasure side of the account I have nothing to say. I confess to eating cooked foods, but I eat cooked foods for the same reason that I imbibe alcoholic drinks and smoke tobacco—namely, because I am base and material and vulgar enough to enjoy them. But I am not so foolish as to suppose that any of these things do me good. The best I can expect from them is that they shall do me no harm. When they have done me the harm which I have deserved I return with prayer and fasting to primitive methods, and in sackcloth and ashes I live for a period on dairy produce and uncooked vitamine-containing fruits and vegetables.

Fear is always a stupid counsellor, and when it masquerades as a scientific gent it is dangerous as well as stupid. The present dietetic scheme of our community has been dictated by fear and furbished by stupidity. The fear is the fear of the microbe. Now, it is obvious to any one who will trouble to give the matter a moment's thought that the microbe becomes formidable only when he is furnished with a soil which is favourable to his development. If we offer him a soil which is inimical he will languish and die. He may put up a fight and cause us the inconvenience of an acute disease, but so long as our soil is really inimical he cannot cause us a chronic disease. The most favourable soil for his purposes is the soil which is deprived of vitaminous foods. If you will carry your mind back you will realize that we seldom heard of rickets, and never of adenoids and appendicitis, until we began boiling our children's milk and opposed our puny wisdom to the ingestion of raw fruits and vegetables. It is now admitted that a large part of the digestive processes are performed by bacteria. If all the bacteria are destroyed by cooking in a holocaust of brutal impartiality, where are the reinforcements of our effectives to come from? It is therefore not only our vitamines which are destroyed by cooking, but our other vitalizers. In our insane fear of our enemies we slaughter our best friends.

Now this intensive vitamine dietary, the exclusion, that is, of all cooked foods and drinks, is extraordinary efficacious therapeutically. It not only assists other forms of treatment by improving the soil and reinforcing the defences, but it is of itself positively curative in most forms of chronic disease. The wonders which it works in what for want of a better name I may call the rheumatics, or middle-aged arthritis, are no less wonderful than the wonders of thyroid extract in myxoedema. In diseases and disorders of the intestinal tract, including gastric and duodenal ulcer, its results equal anything in therapeutics with which I am acquainted. Under its influence constipation and intestinal stasis completely disappear, and with them the host of maladies and symptoms to which Arbuthnot Lane has called attention. If I may argue from two cases, one of twenty years' standing and one of five, it not only causes the complete disappearance of sugar from the urine, but the re-establishment of seemingly perfect health, objective and subjective.

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DR. CORRY MANN said that his contribution to the discussion concerned "rickets." For some seven years prior to the war he had been watching the swinging effects produced upon the diet of working-class families by variations in wages in a district where casual labour was constantly present. In 1914 he was asked to undertake work for the Medical Research Committee in the form of a study upon the relationship of environment and rickets. A preliminary report was sent in bearing upon 330 cases which had been collected during the years 1908 to 1914, and so far as the work had then proceeded dietetic factors seemed to be more important causes than those of housing. The work was discontinued owing to the war, and in the meantime the interesting report of the Glasgow workers, headed by Professor Noël Paton and Dr. Leonard Findlay, appeared (Special Report No. 20, Medical Research Committee), and also the stimulating and conscientious work of Dr. Edward Mellanby at Cambridge.

Dr. Corry Mann has now taken up the work again in London, and 1,000 cases of rickets, with 250 controls of healthy children living in the same district, are being collected. In view of the importance attributed in Glasgow to housing factors, every home is studied with great care, and complete details of home conditions, wages, occupation, married women's labour, casual labour, locality, number, size, and situation of rooms are noted and confirmed by expert visitors. The cases are being collected during eighteen months, in order that wage and housing factors may remain constant as far as is possible, and the clinical progress of the cases is noted during that time.

About 400 cases of rickets and 100 controls have been collected so far from the out patient departments of the Evelina and Guy's Hospital, and from several infant welfare centres, mostly situated in the South London riverside districts. So far as the investigation has proceeded, housing factors do not appear to be of primary importance. Controls and rachitic children are living side by side under the same conditions. Very little "moving house" has occurred.

The cases of rickets fall into the following groups:

	Per cent.
1. Fat deficiency and fat deficiency with carbohydrate excess	44
2. Breast feeding.—Poor breast milk; prolonged breast feeding, mother receiving insufficient or poor food, for a variety of causes	16
3. Finance.—Casual labour factors, married women's labour, unemployment; insufficient wages to meet increasing size of family, etc.	13
4. Diathesis.—Evidence of rickets, well marked, still obvious in one or both parents. These cases do not seem to be influenced by the presence of adequate animal fat in the dietary	8
5. Carbohydrate excess	6
6. Premature children	4
7. Gastro-intestinal catarrh, recurrent or chronic ...	4
8. Queries.—Cases as yet unexplained	3
9. Post-infective malnutrition	2

It is worthy of note that during the fall of last year (1919) when the price of fresh milk rose from 8d. to a shilling per quart, at least 50 per cent. of the families under observation stopped buying fresh milk. The investigation is proceeding.

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My contribution to this discussion will be limited to the deficiency diseases scurvy and beri-beri. The present position of vitamines in clinical medicine appears to call for the following considerations:

I. Are the animal experiments which have been so carefully and exhaustively worked out to be admitted as applicable to man?

II. Has the theory of the importance of vitamines or accessory food factors in a daily dietary been conclusively proved by clinical observations on a sufficiently large number of patients suffering from diseases due to a definitely proved absence of these accessory food factors?

III. Has the theory been established from the point of view of the prevention of deficiency diseases by the addition to the dietary of vitamine-containing articles where previously, owing to their absence, these diseases had occurred?

IV. What are the applications of the vitamine theory in clinical medicine?

I.

It will, I think, be generally admitted that, as regards animal experiments, the causation of scurvy or symptoms analogous to it in guinea-pigs, monkeys, etc., are applicable to man with certain reservations as regards the degree of susceptibility to scurvy of the type of animal experimented upon. Likewise with regard to beri-beri the causation of polyneuritis in pigeons, fowls, rats, etc., by dietaries deficient in the water-soluble B factor are applicable to beri-beri in man with similar reservations. The animal experiments in question have been of the greatest value in placing the etiological causes of scurvy and beri-beri on a scientific and quantitative foundation, and it must be added that similar animal experiments where not the causation of the disease but its prevention or cure by the addition of certain articles containing the necessary vitamines have been of equal value in furnishing a scientific proof.

II.

The proof that scurvy and beri-beri are definitely caused in man by diets consumed over a long period which are deficient in the necessary vitamines must be admitted as having been conclusively established.

Scurvy.

The interesting records of the British navy, of Polar expeditions, and of recorded long voyages at sea—accounts of some of which are given in the admirable Report of the Medical Research Committee, No. 38—furnish, in the light of present-day knowledge, proof of this. The history of the war furnishes perhaps the most conclusive proof. The Mesopotamian campaign was one in which scurvy and beri-beri occurred to greater extent than in any other. Owing to the intense heat and to the difficulties of transport in that country the provision of supply of fresh vegetables or fruits to the troops in the fighting area was impossible during a long period. As a consequence a most serious outbreak of scurvy occurred in the Indian troops in 1915 and 1916. In 1916 from July 1st to December 31st over 11,000 cases occurred. These men were having a ration which, as regards calorie value and protein, fat, carbohydrate, and mineral salts content, was more than adequate, but which was entirely free from antiscorbutic vitamines. As a result of this scurvy developed in alarming degree. The characteristic symptoms of anaemia, depression, debility, hyperplastic haemorrhagic changes in the gums, haemorrhages into muscles, oedema, subperiosteal haemorrhages, scorbutic diarrhoea, and other symptoms occurred in a large number of men.

As soon as it was possible to issue in the daily ration articles containing the necessary accessory food factors, such as fresh vegetables and fruits, the epidemic of scurvy rapidly disappeared. A similar result occurred in hospital cases of scurvy where the defect in dietary deficiency could be remedied. British troops were practically exempt from scurvy in consequence of a liberal allowance of fresh meat, which Indian troops, in consequence of racial prejudices, could not avail themselves of. Another reason was that the British arrived in the country well protected against scurvy, while Indians often arrived in Mesopotamia on the borderland of scurvy.

In Northern Russia scurvy likewise occurred amongst the Russian prisoners and civil population in 1919, due to the same causes.

Isolated epidemics occurred amongst native labour corps in France from similar causes.

Beri-beri.

It has been conclusively proved on numerous occasions that epidemics of beri-beri have occurred in rice-eating peoples, where the dietary has consisted mainly of polished rice from the grains of which the germ and aleurone layer have been removed, these constituents being the vitamine-containing portion of the grain.

In Mesopotamia the British troops were supplied with white flour which was deficient in necessary vitamine in consequence of the removal of the germ and aleurone layer in the milling of the flour. As a consequence of this cases of beri-beri occurred. During 1915 and the first half of 1916 the diet of the British soldier was generous as regards protein fat and carbohydrate content and mineral salts and calorie value. It was, however, greatly deficient in substances containing the water-soluble B factor, or anti-beri-beri vitamine, and, in consequence, cases of beri-beri appeared, particularly in men exposed to hardship and heavy work.

The Indian soldier remained immune from beri-beri since the main part of his dietary consisted of "atta," a coarsely ground wheat flour containing the germ and aleurone layer of the grain, and therefore rich in the necessary accessory food factor. A further source of the water-soluble B factor was the daily allowance of 4 oz. dhall (small lentils either whole or split).

Beri-beri was manifested by muscular weakness, multiple neuritis, and symptoms of cardiac dilatation, such as dyspnoea, swelling of the legs, etc.; they formed a characteristic clinical picture.

In the case of both scurvy and beri-beri it has often been observed that, given a certain vitamine deficiency, excessive hardship and fatigue will act as additional predisposing causes and accelerate the onset of the deficiency disease. In the treatment of patients suffering from some disease, such as enteric, dysentery, or jaundice, requiring a liquid diet, should the diet consist of sterilized foods, such as tinned milk, bovril, etc., as was often the case in Mesopotamia and the Dardanelles during the war, it was remarkable how quickly the early signs of scurvy or beri-beri might develop. Such dietaries always need supplementing with articles containing the necessary vitamine—for example, fresh orange juice, fresh lemon juice, raw egg, marmite, etc.

III.

The proof that deficiency diseases, when occurring amongst men on a ration scale deficient in necessary vitamines, can be prevented by the addition of articles containing these vitamines, must be regarded as definitely established. The history of epidemics of scurvy and beri-beri during the war affords conclusive evidence. For example:

In Mesopotamia scurvy was quickly stamped out from the army when the regular issue of fresh vegetables, fruit, and fresh meat became possible for all troops. Likewise beri-beri in British troops ceased to exist when the ration scale contained such articles as oatmeal, lentils, marmite (extract of yeast), and bread made with a certain proportion of whole-meal wheat flour or atta.

IV.

The Application of the Vitamine Theory to Clinical Medicine.

Since a dietary in which the necessary vitamines are practically absent will, if consumed over a long period, produce the grave symptoms associated with scurvy or beri-beri, so it may be confidently assumed that diets deficient to a certain degree may be followed by clinical symptoms of illness.

The extremely interesting and important researches of Lieut.-Colonel R. McCarrison have shed quite a new light on the influence of vitamines in nutrition, and our conception of the action of these accessory food factors has become greatly enlarged in consequence. It appears that vitamines have a wide-reaching influence on all the organs of the body, and that the functions of the endocrine glands, of the gastro-intestinal tract, the heart and nervous system, etc., are powerfully affected. Absence of vitamines in the dietary of an animal causes marked changes in practically all the bodily organs; thus, colitis, entero-colitis may be

early symptoms, and marked changes may occur in the suprarenal glands, for example, if the dietary is deficient in antiscorbutic or antiberi-beri vitamines.

It seems certain that these views are applicable to clinical medicine in man. In cases of malnutrition, whether due to a defective diet or to some chronic disease, such as sprue, chronic colitis, dysentery, etc., it is most important that the dietary should be most liberal as regards vitamine content, and the articles of the dietary should be specially selected from the point of view of high vitamine value. Also it should be borne in mind that in such cases, since the secretions of important organs such as the pancreas and liver are often profoundly affected, the addition of appropriate remedies to the dietary, such as pancreatic extract, liver soup, etc., will often materially benefit the patient. It must be remembered that vitamines have not only an important action on the general nutrition of the body but they also have a reaction on the functions of the important secretory glands, and when these functions are impaired, due probably to actual pathological changes, a diet rich in vitamines will have a markedly beneficial effect in stimulating the repair of the damaged organs and their impaired functions.

In the diet of infants or of patients of any age suffering from diseases associated with malnutrition, such as colitis, chronic dysentery, sprue, coeliac disease, chronic diarrhoea, and gastro-intestinal diseases generally, the best clinical results will be obtained by a judicious selection of a diet which is not only suitable for ready absorption in the individual case but which is rich in all the important accessory food factors. Success has already been achieved in the production of certain preparations rich in vitamines which may conveniently be added to the dietaries of the sick—for example, marmite; extracts of rice germ and polishings, as used in the Philippines; extract of raw egg yolk; fresh juices of raw fruit and vegetables (for example, fresh lemon juice or turnip juice), and other preparations containing antiscorbutic vitamines.

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RECENT laboratory and clinical experiments suggest that both deficiency of certain food elements as well as excess of others may both lead to conditions of malnutrition. There was to my mind at one time a serious risk of the deficiency diseases overshadowing the excess diseases. It certainly has been my clinical experience that a larger number of cases of malnutrition are due to excess, and can be cured by cutting down, than to deficiencies which can be corrected by supplementary supplies. In the first enthusiasm of the vitamine movement there was a great danger that the fundamental principles of dietetics, supply and demand, and the conservation of energy would be relegated to a secondary position of importance not only in the feeding of infants, but also in the feeding of adults. Even at the present time there are many individuals who ought to know better who believe that vitamines are a source of energy and that the more carrots they eat the stronger will they become; on the other hand, it seems to me that the vitaminists are getting away further and further from their original claim that the so-called deficiency diseases are solely due to the deficiency of some particular vitamine. This is more particularly true of rickets. The original claim was that rickets was due to a deficiency of the fat-soluble A accessory food factor; they now admit that excess of carbohydrate, a deficiency of protein, want of opportunity for exercise, want of fresh air, and all the old familiar hygienic factors also play important parts in the etiology; they leave us, in fact, *in statu quo* with respect to the causation of rickets, except that more emphasis is laid on the importance of fat than was paid by the old clinicians. So far from explaining the causation of rickets, I think that the vitaminists have drawn a herring across the trail by labelling one of their will-o'-the-wisp discoveries the antirachitic vitamine. Such an explanation of rickets takes a very narrow view of the protean etiology of the disease. It seems to me to be a libel on an almost universal disease in childhood to claim that it is caused in all cases by the want of what is an almost universal element in the food of infants. If their claim is true, a disease which is commonly regarded to be the complex result of civilization will be banished from civilization by the distribution of small rations of cod-liver oil. Personally, I am convinced that all forms of malnutrition, whether due to deficiencies, or to excesses, or to want of fresh air, exercise, or to the effects of chronic infections, all lead to the same goal—namely, rickets, if they are sufficiently long continued. And I believe that they lead to this goal for the reason that a demand for calcium is created in the body which overrides the claims of the growing cartilage. The two salient factors which we find in rickets, from whatsoever cause engendered, are a deficiency of calcium in growing bone, and an excess of calcium in the excretions from the body. All the common etiological factors of rickets lead to the defective oxidation of the food consumed and to the production of acid bodies of large molecular size. If these acids were not neutralized by available bases, there would be a serious disturbance of the hydrogen-ion concentration of the blood; in other words, an acidosis. No doubt, in accordance with the principles of physiological expediency, the cheapest bases, such as sodium and ammonium, are first drawn upon for the purposes of neutralization, but the time ultimately arrives when the more expensive bases, such as calcium and iron, are also pressed into service. I willingly admit that the want of the fat-soluble A vitamine is one of the causes of rickets, but not a bit more so than the want of the antiscorbutic vitamine. I believe, however, that far commoner causes of rickets are want of muscular exercise and excess—that is to say, relative excess—of the energy value of the food supplied. All these causes, however, lead to defective calcification of bone, which is pathognomonic of rickets through one common pathological route—namely, the creation of a demand for calcium which is even greater than the demand of developing bone, this demand being the claims for neutralization of the semi-oxidized products of combustion.

S. MONCKTON COPEMAN, M.D., F.R.S.,
London.

I SUPPOSE that, as indicated by Professor Hopkins in his opening remarks, this discussion will be mainly concerned with the nature and extent of the various forms of disease which we now have reason for associating with absence, in greater or lesser degree, from a dietary, of one or more of the food accessory factors known as vitamines.

But if I may be permitted, I desire, on the other hand, to direct attention to the possibility of exerting some useful therapeutic effect by the *purposeful* restriction of the amount of the A and B growth accessory factors in a dietary otherwise well balanced and of varied and appetizing character.

In view of the divergent results obtained by Professor Hopkins on feeding young or older animals on a diet of chemically purified constituents, I suggested to him, some eight years ago, that he should investigate the results of a similar dietary on mice or rats suffering from cancerous tumours—of spontaneous origin if possible—in order to see if any differential effect could be observed between the growth of the tumour cells, which presumably require for their continued increase and multiplication considerable store of the vitamines in question, and of the general tissue cells of the adult body, to which they are apparently not so indispensable. In May, 1912, Professor Hopkins wrote to me saying that he thought it might be worth while carrying out such an experiment, and asking me to put him in touch with Dr. Bashford, then Director of the Imperial Cancer Research Laboratories, in order that he might obtain the necessary material. This I did, and in a paper read by him about eighteen months later Professor Hopkins stated that when, after a given period, he examined the tumours in the (chemically pure) dieted animals and in the controls respectively, he found that the average weight of tumour substance in the former was only about one-quarter of that in the controls. Unfortunately, no one, so far as I am aware, has carried out an experiment on precisely similar lines in which rats or mice suffering from tumours of spontaneous origin were employed.

About this same time, however, as I stated in the discussion on a paper by Sir Thomas Horder at the Royal Society of Medicine in January, 1913, a few patients in one of the metropolitan infirmaries had been treated with a dietary which was intended to be deficient in the growth accessory factors, but great difficulty was experienced in

preparing it, as it then appeared necessary to autoclave the various constituents, with the consequence that the dietary was neither varied nor appetizing. Nevertheless, results sufficiently encouraging were obtained in one or two instances to make it seem worth while to continue the work, which, however, was interrupted by the outbreak of war in 1914. Early in the present year, however, the investigation was recommenced, under the auspices of the Ministry of Health, in view especially of the fact that the Registrar-General's statistics indicated that during 1918, the year during which rationing of food was general, there had been some diminution in the number of deaths from cancer, both in males and females—much more marked for London than for the country generally.

Moreover, thanks in large part to the investigations of Miss Chick and others at the Lister Institute, it is now possible to construct a varied and sufficing dietary practically free from growth accessory factors. At the present time a considerable number of patients in certain of the metropolitan infirmaries are living on such a dietary. Some of them have been under treatment since February last, yet in none of these patients have any symptoms indicative of beri-beri, for instance, been observed—a fact of considerable interest and importance as indicating that when the diet is well balanced, varied and appetizing, the fairly complete absence of these vitamines is perhaps of less importance, in the adult, than Lieut.-Colonel McCarrison's work on monkeys would appear to indicate.

That, under certain circumstances, this may be so in the adult is, I think, indicated by the curve on the chart exhibited, which shows that the patient's weight, instead of falling, has slowly but steadily increased week by week. The general condition, moreover, has improved *pari passu*, with the result that whereas, when treatment was commenced, an opiate was being given every night, nothing in the way of a hypnotic is now required.

GENERAL DISCUSSION.

Dr. R. L. MACKENZIE WALLIS (London) said the chief point brought out in the discussion had been the merit of a well balanced diet, and in addition the use of fresh foods instead of what might be called "stale" foods. In an investigation of metabolism in the insane, which he had carried out some years ago, he had found that the diet was deficient, and in only one instance was the individual in nitrogenous equilibrium. It would appear that the adoption of a well balanced diet containing the necessary accessory food factors will produce valuable results. During an investigation of the food value of the ground nut (monkey nut) he had proved conclusively its valuable properties in the prevention and treatment of beri-beri. Another disease which he considered a deficiency disease was coeliac disease. In cases treated with a balanced diet and rich in vitamines the results had been almost magical in that the stools rapidly assumed their normal colour and consistency, the weight of the patient increased, and the girth of the abdomen decreased. In epidemic diarrhoea of infants he had obtained results identical with those described by Lieut.-Colonel McCarrison, and particularly the characteristic changes in the pancreas. This subject was now being pursued along these lines.

Dr. J. C. DRUMMOND (London) gave an account of the effect produced on the progeny of experimental animals fed on diets deficient in various essential elements of the nature of vitamines. He pointed out that slight dietary inadequacies of this nature produced a great tendency, in experimental animals, to the incidence of intercurrent diseases of all sorts. He also quoted experiments that went to prove that it was not practically possible to restrict the growth of experimental cancers by limitation or selection of diets. Starvation of such new growths was apparently impossible without the starvation of the host.

Dr. C. MUTHU (Mendip Hills Sanatorium) said he agreed with Dr. Leonard Williams that all diseases could be more or less attributed to some food deficiency. Some experiments on fresh and stale vegetables and fruit were conducted at the sanatorium with the aid of a galvanometer, as recommended by Baines and A. W. Robertson. The results showed that both vegetable and animal life contain a well-defined electrical system, and that phenomena of life could be best explained in terms of electro-motive force of the cell organism. The fresher the food the more fully its electric potential was maintained. The more stale the fruit or vegetable, the greater its diffusion of electricity, and when it was rotten it was electrically dead. Civilization meant stale and cooked food, tinned and frozen food, artificial and adulterated food, in all of which, the vitamine and enzymic content being low, man becomes a prey to diseased conditions. In conclusion, Dr. Muthu said that he was firmly convinced that tuberculosis was a deficiency disease.

Dr. JOHN BROWN (Blackpool) said that in dealing with the subject of vitamines—for which a less misleading term would be "vitaids"—the trend of recent researches, together with his own clinical observations, compelled him to draw the following conclusions: The general public, and above all the Government, need to be taught that there was literally a vital difference between fresh food and preserved food, between natural and artificially prepared foods. "Ice age" refrigeration methods were preventing the public from having fresh food and offered instead "stale" food. Mankind was not called upon to eat raw food exclusively, but it was well to bear in mind that even the animals which do not actually try to swallow living prey always try to obtain living tissue. From his own experience and observation, the allotment holders consuming their own fresh-cut vegetables and picked legumes, which were *live cellular* foods, fought influenza much more easily. The high mortality during and since the war from influenza and pneumonia had in part, he believed, been due to the reduced power of resisting disease resulting from the increased use of refrigerated meat and preserved food. He advocated more frequent resort to salads.

SECTION OF SURGERY.

Sir GEORGE H. MAKINS, G.C.M.G., C.B., P.R.C.S., President.

THE TREATMENT OF CALCULI IMPACTED IN THE PELVIC PORTION OF THE URETER.

BY

FRANK KIDD, F.R.C.S.,

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STONES impacted in the pelvic portion of the ureter are usually solitary stones, ovoid in shape, consisting of calcium oxalate and calcium phosphate, crystalline and opaque to the *x* rays. Jeanbrau,[1] quoted by Geraghty, states that in 204 cases collected from the literature 96 per cent. of the stones were unilateral, and in 90 per cent. of the cases only one stone was present in the urinary tract. These facts are of considerable practical importance in regard to treatment. Stones casting giant shadows are usually associated with congenital malformation of the lower end of the ureter.[2]

The wall of the ureter at the site of impaction undergoes fibrosis and stenosis. The ureter above the stone becomes dilated, and sooner or later bacteria filtering from the blood through the kidneys infect the kidney and ureter. In the last stages an abscess may form round the stone, which bursts into neighbouring organs, such as the rectum and vagina, or on to the skin; so that a fistula arises through which the stone may be discharged on to the surface of the body.

Ureteric stones may for years cause no symptoms. Symptoms when they arise differ in no essential particular from the symptoms caused by renal calculi. Usually there are attacks of pain which may bear the character of a fixed renal ache or of a moving renal colic. Haematuria is common, but is by no means invariable. On the other hand, if there is no microscopic evidence of blood in the urine in a case suspected of ureteric calculus, it is probable that the symptoms are caused by something other than calculus. Pyuria and fever mark the later stages of the trouble. At times these cases become urgent through the development of calculous anuria.

DIAGNOSIS.

In no other type of case is it more important to make an accurate diagnosis before considering the question of treatment. Mistakes in treatment are usually due to errors in diagnosis.

Diagnosis of Ureteric or Renal Colic due to Stone from other Causes of Ureteric and Renal Colic.

Renal colic may be caused by a stone or by blood clot, and rarely by the presence of tuberculous curds, masses of growth, or hydatid cysts passing down the ureter. It may also be caused by stricture in the wall of the ureter, congenital or acquired from stone or tuberculosis. It may also be caused by abnormal renal blood vessels, by congenital kinks of the ureter, by movable kidney, and by tumours or adhesions obstructing the ureter from the outside. Ureteric pain has to be distinguished from other causes of abdominal pain, such as the various colics, intestinal obstructions, twists, haemorrhages, accidents to blood vessels, peritonitis from bacterial invasion or from gross rupture of a viscus, also from acute inflammations of the kidney and from the crises of tabes, acute pleurisies, and diseases of the spine. Up to 1909 Jeanbrau could only collect from the literature 172 cases operated on; this was before the universal use of the *x* rays in diagnosis. The progress of radiography has increased the detection of shadows in the pelvic portion of the ureter, but even now Geraghty[3] states that 22 per cent. of stones present in the ureter are missed by the *x* rays. I think this statement errs on the large side. In the course of routine *x*-ray examination of the pelvis it is not unusual to observe in the region of the pelvic ureter shadows not cast by stones. More often than not these shadows are cast by extra-ureteric concretions. The commonest cause of these shadows is the phlebolith.[4] Other shadows that cause confusion are those cast by calcareous glands, appendix concretions, intestinal contents, and calcareous arteries.

Before a decision is made that an *x*-ray shadow in the pelvis is due to a stone in the ureter it is absolutely essential to employ special methods of differentiation. One method is to pass up the ureter a bougie opaque to the *x* rays and take another *x*-ray picture. In many cases the shadow of the tip of the bougie can be seen touching the doubtful shadow, but sometimes the evidence thus obtained is not conclusive. Another method is to inject 20 per cent. colloid silver into the ureter through an ordinary ureteric catheter and then to take an *x*-ray picture. If a stone is present there will be seen the shadow of a dilated ureter above the stone shadow, which will appear to be lying at the site of a narrowed portion of the ureter; such evidence, if it can be obtained, is conclusive that the doubtful shadow is cast by a stone. Another method is to pass wax-tipped bougies up the ureter, when scratches can be detected on the wax.

The practical point remains that no operation should be undertaken on the ureter for the removal of stone until supplementary *x*-ray methods have been employed in addition to ordinary *x*-ray methods.

TREATMENT.

The great progress made in the last ten years in the treatment of ureteric stones should be chiefly associated with the name of Bransford Lewis.[5] Many surgeons still appear to be under the delusion that directly a shadow of a stone in the lower ureter has been shown by *x*-ray examination they should immediately cut down and try to remove the stone. Nothing is more fallacious than this idea, which has led to many disasters. When faced with a ureteric calculus, the first point for the surgeon to decide is as to whether any surgical interference is needed at all, as in many cases it is not. The second point to decide is, if surgical interference is needed, what form shall that interference take?

Through improvements in the operating cystoscope it is now possible to persuade stones down the ureter by means of the cystoscope working across the bladder, so that the patient is saved from a major surgical operation not without danger to life and risks of mutilating complications. I do not think this fact has been at all widely appreciated by the general surgeon. When faced, then, with a shadow that may be a shadow cast by a ureteric stone, make doubly and trebly sure that it is a stone shadow. Then make up your mind how much harm it is doing to the patient's mind in the way of painful stimuli, and how much harm it is doing to the patient's kidneys and ureters.

How long may a ureteric stone take to pass naturally? I have recently seen a case in which a patient passed a ureteric stone naturally after eight years of intermittent colics. It seems clear to me that no time limit can be given after which we can state that a patient will not pass his stone. Each case must be judged on its merits. It is better to give Nature sufficient grace rather than to be in a hurry to operate.

Experimental work on animals to determine how long a stone can lie in the ureter before damaging the corresponding kidney irreparably suggests that six months to a year is the longest time during which a stone ought to be allowed to obstruct the ureter. But from clinical evidence I am convinced that such experimental work does not reveal the whole truth. In the first place, stones rarely block the ureter completely, so that natural conditions differ from many of the experimental conditions. In the second place, clinical evidence suggests that the kidney may recover sufficiently to do much useful work, even if the ureter has been partially blocked for many years by a stone (as long as twenty years in some cases I have encountered). Provided, then, that there are no imperative indications for operative interference, I think it advisable always to give the patient at least one to two years in which to pass a ureteric stone naturally, aiding Nature by minor cystoscopic manipulative measures, and employing flushing treatment and urinary antiseptics by the mouth.

Operative interference may be said to be *imperative* if there is bacterial infection of the kidney and ureter above the stone, as is shown by the presence of pyuria, fever and wasting; if there is calculous anuria; and if stones are bilateral (as they are in only 4 per cent. of the cases).

Operative interference will be *advisable* if the stone is clearly too large to pass, and if the patient is suffering from long-continued, severe and fixed pains which are undermining the health.

In the ordinary cases which have only presented symptoms for a year or two, where symptoms are only occasionally present and not severe, and the pain is lower down after each attack, efforts should be made to coax the stone down the ureter by the help of "drink cures" and the more recent methods of operative cystoscopy. This will be granted if the mortality and complications of an open operation are considered. Israels[6] reports 60 cases operated on by himself, with, as far as I can gather, 7 deaths. Tenney[7] states that the mortality of open operation is somewhere between 15 per cent. and 20 per cent., from haemorrhage, shock, sepsis and peritonitis. Other complications of the operation are fistula, failure to find the stone, destruction of the ureter, thrombosis, dilated stomach, and pulmonary embolism.

Methods for Coaxing a Stone Down the Ureter.

In the first place the patient should be flooded with diuretic waters, and should take regularly every day urinary antiseptics by the mouth with the object of preventing bacterial infection if it has not already arisen. A cystoscope should be passed and various methods of cystoscopic extraction tried. These methods are, briefly, as follows:

1. Injection of sterile paroleine through a ureteric catheter around the stone may induce a stone to pass a few days later. I report 4 cases where I have obtained success in this manner.

2. Recently it has been suggested by Geraghty and by Walther[8] to inject 5 c.cm. of a 4 per cent. solution of papaverine sulphate locally into the ureter through a catheter. This alkaloid causes direct relaxation of unstriped muscle fibre. It causes relaxation of the ureteric muscle in the region of the stone, and has been successful in causing stones to pass naturally.

3. With the operating cystoscope and the special scissors of Bransford Lewis it is possible to cut up the superior wall of the mouth of the ureter, starting from the mouth of the ureter and cutting it up through the wall of the bladder for at least three-quarters of an inch. After this minor operation has been done it is possible to try and pull the stone down with forceps or to dilate the ureter with a probang through the cystoscope. So far I have failed to catch a stone with forceps after this operation and pull it down, but in nine cases the stone has been passed naturally within a few days after I have cut the mouth of the ureter in this manner. In some cases I have been able to observe the slit some months afterwards. It appears to heal up soundly without stricture formation and causes no bad

after-result. The lower end of the ureter is often very narrow in these cases and appears to be the main cause which prevents the stone from passing naturally. This method appears to be a triumph of manipulative surgery when we can thus get a stone to pass and save the patient from a major operation. Progress in surgery consists in substituting minor surgical procedures for major surgical operations. The treatment of villous growths of the bladder by fulguration through the cystoscope is another good instance.[9] Surgeons are still very slow to adopt these methods and to give up more spectacular and more dangerous procedures.

4. It is possible to cut the mouth of the ureter in similar fashion, using the insulated copper and platinum electrode through a cystoscope attached to a diathermy machine. I know of several cases where this has been done successfully, but I prefer the scissors method.

5. Finally, it has been suggested to pass a ureteric catheter, with a small dilatable bag attached, as far as the stone. The bag is dilated with air, and traction is made so as to dilate the ureter below the stone. The principle is similar to that of the bag used in midwifery for dilating the mouth of the uterus.

The methods briefly mentioned should be given a fair trial before an open operation is performed. Those, then, who wish to deal with these cases should make themselves familiar with the technique of operative cystoscopy.

Open Operation.

Finally, if the surgeon decides on open operation, he has to consider the best method of approach for the removal of stones in the lower portion of the ureter. I need not discuss the numerous methods of approach, which are now merely of historical interest. For practical purposes the routes of approach to the pelvic ureter have been narrowed down to two. One is by means of a small muscle-splitting incision in the inguinal region, such as I have described in the *Lancet*, June 7th, 1913. The other is to use the middle line, through which to expose fully the bladder and lower ends of the ureters. This latter incision is needless when a stone in one ureter is being dealt with, that is to say, in 96 per cent. of the cases, as it is liable to be followed by hernia. It should be employed only when there are stones in both ureters to be removed, as thereby it is possible without much difficulty to expose both ureters throughout their pelvic course, the operation being similar to that for partial cystectomy. In the majority of cases the incision I have described is to be preferred, as it eliminates the risk of hernia. That the operation done through this incision is a very safe one in practised hands will be shown by the figures I can bring forward. Since 1910 I have operated on twenty-eight cases through this incision. Two of these cases were suffering from calculous anuria. I have only lost one patient, a very fat subject in which there was great difficulty in getting down to the stone. The operation was prolonged, and the patient developed a dilated stomach which defied all remedies and led to a fatal issue. In one case I failed to find the stone, as the operation was done under great difficulties in a bad light in the country in the patient's own home. The ureter was left open and a fistula formed, through which the stone was subsequently discharged, and then the wound healed up satisfactorily. In all the other cases the wounds have healed up by first intention, except for the hole through which the rubber drain emerged, and most of them have been able to rise from bed on the tenth day and leave the hospital or home on the fourteenth day. In one case an impermeable stricture developed in the ureter after the operation, and I had to remove the kidney, which had been rendered useless as it had been blocked for years.

I think these figures prove that there is no need for the large and extensive incisions described by Israels,[6] and that the ureter may be very satisfactorily exposed extraperitoneally through a small muscle-splitting incision with very little risk to the patient and with few complications. The operation should be performed extraperitoneally if possible, but in exceptional cases it is permissible to open the peritoneum if anything can be gained thereby.

There are one or two points I would like to mention before closing. It must not be forgotten that a stone apparently impacted in the lower end of the ureter may suddenly get displaced and run backwards up the dilated ureter into the kidney. The mere passage of a ureteric bougie may effect this, or the placing of the patient in a head-down position. It is always advisable, therefore, to have an *x*-ray picture taken a very short time before the operation. Another point is that there should be no hurry to make a diagnosis of ureteric calculus unless microscopic blood is present in the urine.

In all cases Nature should be given a fair chance, and if Nature is to be aided by artificial means, let minor methods be adopted first and major operations left to the very last. It is far better that the patient should pass the stone naturally than that he should be interfered with too soon by the surgeon. In a series of 20 consecutive cases a ureteric stone was passed naturally in 15 cases, and in only 5 was surgical interference needed.

In a small number of cases trouble will arise after the stone has been removed. The ureter may become so narrowed at the site that the kidney becomes dilated, infected, and painful. If it is feasible, measures designed to dilate the stricture of the ureter through the cystoscope should be taken. If this fails the functional value of both kidneys should be estimated, and if the affected kidney is clearly of little functional worth it should be removed. Stricture only arises in cases in which the ureter has been impacted for many years—that is, in cases where the kidney has already been destroyed by intermittent back pressure and bacterial infection. In one of my 28 operated cases I had to remove the kidney after operating on the ureter, and in one case I removed stones from the kidney successfully after a successful operation on the pelvic ureter.

Summing up, I would lay down these golden rules: Be careful not to mistake the shadow for the substance. Always give Nature a chance and do not be in a hurry to perform a major operation. Train yourselves to employ minor surgical methods, which is the line of safety for the patient.

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DISCUSSION.

MR. J. S. JOLY, F.R.C.S.Lond., said that in performing the open operation he preferred the median incision, as he could with ease expose to view the whole length of the ureter, the route being specially useful in those cases in which the stone had a tendency to slip up the ureter, as certainly happened. There were three landmarks that could be used as guides in reaching the pelvic ureter through the median incision:

1. By tracing the internal iliac artery to its bifurcation the ureter was felt under the finger.
2. To reach the middle portion the spine of the ischium should be felt for and the finger moved a quarter of an inch towards the middle line.
3. The extreme lower end was reached by following the vas deferens.

The choice between operative cystoscopy and open operation depended on various circumstances, the chief of which was the size of the stone. He could not agree that it was wise to wait indefinitely before operating to remove the stone; there was every chance of distension and dilatation being set up, especially if the stone were septic. If a shadow as large as a sixpenny piece were proved to be a stone, manipulation could rarely remove it, and open operation was required. Stones below that size were a troublesome problem, and those about the size of the pip of an orange were difficult to decide upon. Below that size they should have a chance of finding their way into the bladder. The question of sepsis or asepsis played a large part: if the ureter were infected it was safer to operate early; if the urine was aseptic it might be proper to wait till another attack of colic took place and have another *x*-ray photograph taken. By repeated photographs it could be seen whether the stone was tending to pass down or not. A stone smaller than an orange pip which had no tendency to movement downward should be operated on. The mortality statistics for the open operation given by Mr. Kidd were rather gloomy. He

(the speaker) might have been lucky, but out of 23 open operations by middle line incision he had had no operation mortality.

Mr. GREY TURNER (Newcastle) pointed out the necessity of differentiating the symptoms of stone in the lower part of the ureter from those associated with the appendix. It was important to make certain, before making a diagnosis of stone in the ureter, that small quantities of blood could be seen in the urine. He was very chary about operating on small stones in the lower end of the ureter. He emphasized, further, the necessity for rectal or vaginal examinations, and also maintained that it was advantageous to open the peritoneal cavity simply for the purpose of locating the stone by exploring the ureter with the finger.

Mr. R. P. ROWLANDS (London) said: I congratulate Mr. Kidd very sincerely on his excellent and instructive paper. My experience of the *x*-ray method of diagnosis is not so fortunate as his. I have removed stones from the ureter in at least fifteen cases during the last ten years when radiographic experts had failed to reveal any stone. Stones rarely form in the ureter, but descend into it while still small from the kidney. Patients who suffer from them are often middle-aged and stout, and many of the stones are either too small or too translucent to cast a shadow with the *x* rays. Therefore the diagnosis has often to be made in spite of a negative *x*-ray report. In these circumstances I have found cystoscopy, after injecting two grains of indigo-carmine intramuscularly, a very valuable and simple method of determining if the ureter is or is not obstructed. Within fifteen to twenty minutes the pigment can be seen issuing freely from the normal ureter, whereas none or very little may escape from the obstructed ureter. This serves to determine the side and degree of obstruction. The method is quite safe, and it is much simpler and easier to adopt than ureteral catheterization. It does not necessarily follow that the obstruction is due to a stone;* it may, for instance, be caused by an abnormal artery pressing upon the ureter, or the formation of a valve at the junction of the ureter and pelvis of the kidney, but it is just as essential to relieve the obstruction, whatever may be the cause of it.

Treatment.—Although ureteral calculi should be given a good opportunity to pass spontaneously, as Mr. Kidd advises, I do not agree with him that it is safe to leave them for two years, for they may irretrievably damage or even destroy the kidney. A stone completely blocking the ureter may permanently destroy the kidney in a few weeks even without any evidence of inflammation or hydronephrosis. It is true, however, that ureteral calculi do not often continue to obstruct the ureter completely for a long time. If the stone cannot be shown to be moving downwards on repeated *x*-ray examination during some six months, I think it wise to remove it in order to restore the kidney to its natural function, and to save it from the mechanical and infective changes which are bound to follow. It is specially important when the stone appears to be of a large size, for an operation becomes urgent when the signs of infective changes or hydronephrosis or anuria develop. I think the statistics quoted by Mr. Kidd are far too gloomy, and probably date back some years. I have not lost a single patient after the removal of a stone in the ureter, and in only one instance have I had to perform secondary nephrectomy, owing to intractable changes in the ureter and secondary destructive changes in the kidney. I have used the incision advocated by Mr. Kidd, but I do not altogether like it, because it does not give a very good access to the very lower end of the ureter. For this reason I generally adopt a long paramedian valvular extraperitoneal incision, displacing the rectus and peritoneum inwards. This gives splendid access without any risk of hernia following. I do not like any form of intraperitoneal operation for the removal of a stone from the ureter, for the urine in these cases is generally septic, and drainage is usually necessary. As instances of some of the troubles which may arise from stones in the ureter I briefly mention two cases:

Case 1.—A nurse, aged 50, had calculous anuria of six days' duration, and was very ill, unconscious, and vomiting. Cystoscopy revealed muco-pus at the orifice of the left ureter. The right ureteral orifice was very small. A stone was rapidly removed from the left ureter a little below the kidney. The patient, after axillary saline infusion of four pints, passed seven pints of urine during the day. She regained consciousness three days later. Ten days later anuria returned, and a stone was then removed by the anterior paramedian incision mentioned above from the left ureter low down, and the patient recovered. Six years earlier she had had a severe attack of right renal colic, and the right kidney had become completely destroyed. I believe that this not uncommonly occurs, and that it is not often recognized when the obstruction is unilateral. Ligation of the ureter will similarly destroy the kidney almost painlessly in the absence of sepsis.

Case 2.—A stout lady had left renal colic followed by high fever for two months. Bacilluria was diagnosed, and a vaccine was tried without relief. Cystoscopy revealed complete obstruction of the left ureter, but operation was declined for a month; the left kidney was then found to be in a condition of acute ascending nephritis with multiple abscesses. A small stone was removed from the left ureter a little below the kidney. Nephrectomy was considered inadvisable. It was hoped that the kidney would recover; it did recover, completely but slowly. Eight years later a calculus became impacted in the upper part of the right ureter, which it completely obstructed. Meanwhile over a pint of normal urine a day was passed by the left kidney. The stone was removed three days after impaction and the patient went home well three weeks later. The contrast between the results of the first and second operation in this case is very marked, showing the enormous value of prompt removal of a stone from the ureter. It may be added that the right pelvis was already full of pus at the time of the operation.

Sir HAMILTON BALLANCE (Norwich) thought it was unnecessary to risk opening the peritoneum in these cases, and he had a personal dislike to small incisions such as Mr. Kidd had described; his preference was for the lateral incision parallel to the iliac crest, this incision enabling him to deal satisfactorily with every part of the lower ureter in the pelvis. Hernia did not result from that long incision even when extended forward to the rectus. There was risk of infection of the cellular tissue, and he always employed a drain. So long as that incision gave him proper access to the stone he was disinclined to go through the peritoneum.

Dr. CHARLES MAYO (Rochester, U.S.A.) desired to commend the stand taken by Mr. Kidd in advocating the removal of stones from the lower part of the ureter by the method described, with which he was familiar and knew to be employed by Dr. Brash in the Mayo clinic. In his experience, however, the open operation was just as safe as the method by operative cystoscopy. If the patients had a history of passing many stones, then he thought that the waiting plan might be adopted, but, if otherwise, then operation ought to be performed. It appeared to him that some regard should be had to the method of formation of the stone. The stone was not formed in the ureter; it was due to bacterial action in the kidney. Two types of bacteria were required—one in the original situation of formation of the stone in the kidney, and the other acting secondarily with the addition of calcium salts in its passage down the ureter.

* See *Guy's Hospital Gazette*, xxviii., 1914, pp. 191-6.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ACUTE OEDEMA OF THE LUNGS.

THE recent correspondence in the columns of the BRITISH MEDICAL JOURNAL on the subject of acute oedema of the lungs or acute suffocative catarrh has directed attention to an interesting type of case in which the etiology is obscure. The transudation of fluid from the blood in the pulmonary circulation to the alveolar spaces must be primarily due to either (1) greatly increased pressure in the pulmonary system, or (2) gross changes in the structure of the lung capillaries.

As Dr. McNaughton pointed out, the explanation usually given is that the condition is due to persistent action of the right heart, with failure of the left heart—that is, to (1) above. Acute oedema of the lung does not appear to have been attributed to sudden vaso-dilatation of the lung capillaries or physical changes in their walls, presumably because at present it is generally considered that the blood vessels of the lungs are almost entirely devoid of any vaso-dilator or vaso-constrictor nerves.

The notes on the 18 cases recently reported in the BRITISH MEDICAL JOURNAL unfortunately do not give information on the state of the patient's heart during an acute attack, and in some cases only has the state of the pulse been noted. On comparing the 18 cases, however, I am struck by two points which seem to favour an "angioneurotic" instead of a "cardiac" theory of the origin of this condition. (1) In two of the most typical cases (Dr. Gale's and Dr. Yellowlees's) the pulse was said to be "full, rapid, and bounding," and "strong and quick" respectively. (2) With one exception the only cases which did not end fatally were those treated with atropine and morphine, drugs which act directly or indirectly on the vegetative nervous system.

This therapeutic evidence appears to support the view that acute oedema of the lungs is not due to a gross defect in the action of the heart but to the reflex effect of a pathological stimulus acting through the vegetative nervous system in a vagotonic individual.

From the notes on several of the cases reported it seems probable that the attacks were originated by some toxic agent absorbed from the gastro-intestinal tract, in this respect closely resembling certain forms of asthma arising from errors in diet, which are recognized as typical examples of over-action of the vagus. This theory would also be supported by the result of the use of atropine in these cases. The effect of morphine, too, is quite compatible with such a view, as presumably this would act chiefly by depressing all the sensory cells throughout the body, thereby reducing or removing the effect of the irritant stimulus causing the reflex action.

Although the number of cases reported is too small to warrant any inference, the sex incidence is of interest, as only 6 out of the 18 cases were in females. The characteristics of the vagotonic person tend to be masculine in type and those of the sympathicotonic person feminine.

It is interesting to note that Laignel-Lavastine includes acute oedema of the lungs as one of the vegetative syndromes indicative of an endocrine disorder, and suggests that the gland at fault is the suprarenal (?deficiency). In the recent edition of *Diseases of the Nervous System* by Jelliffe and White the condition is referred to in the article on Angioneurotic Oedema, and it is said: "The view here tentatively adopted is that it is a neural reaction brought about through the vegetative nervous system, which controls reciprocal tension relations, or cellular chemical composition relations."

No definite evidence has been afforded by any of the cases recently reported in the BRITISH MEDICAL JOURNAL in favour of the view that the condition is due to disorganization of the cardiac action, and the alternative theory, that the condition is a reflex nervous phenomenon arising in certain vagotonic individuals from certain unknown causes, seems to be much more satisfactory. The question might be settled by making a careful note of the condition of the heart and circulatory system generally while the attack is actually in progress.

London, S.W. W. CAMERON DAVIDSON, M.B., Ch.B.

THE TREATMENT OF RINGWORM.

WITH reference to the note by Dr. W. P. Elford it is interesting to record that the treatment he advocates approximates closely to that carried out at the school clinic at Stoke-on-Trent since 1914. I have been unable to lay my hands on the exact number or to remember the name of the contributor, but this form of treatment was described in the BRITISH MEDICAL JOURNAL of that or the previous year.* The details are:—

1. The hair over and for a short distance round each patch is well shaved and afterwards thoroughly washed with soap and water and finally with ether to remove as much grease as possible.
2. The area is then painted with tincture of iodine.
3. *When thoroughly dry* the painted area is sprayed with ethyl chloride.

The active agent is of course the small amount of ethyl iodide formed.

The treatment is repeated twice a week. The average duration of treatment does not exceed a month for scalp cases, while in body cases it is even shorter.

ROBERT HUGHES, M.B. Lond.,
School Medical Officer, County Borough of Stoke-on-Trent.

* The reference appears to be to Dr. C. H. Foley's note in the JOURNAL of March 21st, 1914, p. 651.—ED.

POISONING WITH HYDROCHLORIC ACID: RECOVERY.

THE following case may be of interest, because, in spite of the large amount of acid swallowed, recovery occurred with comparatively little after-effects:

I was called one evening to a young man who had swallowed from a cup, as far as could be ascertained by careful investigation, about 3 oz. of fuming hydrochloric acid (spirits of salts). He had just previously had a heavy meal. He was found a few minutes after the occurrence and promptly given a tumblerful of hot water and mustard.

When I saw him he was lying on the floor in a state of extreme collapse, with very rapid pulse, dyspnoea, cold extremities, and intense abdominal pain. He had vomited and continued to do so, bringing up with much retching quantities of dark brown material with mucus and blood-stained froth. He was given at once morphine hypodermically (which was repeated), milk by the mouth, and within a few minutes sodium bicarbonate in water in fairly large quantities, which was mostly returned. He was also given strychnine and caffeine in large doses hypodermically, and put to bed with hot-water bottles. The following morning the temperature was 100°, pulse 128, and respirations 26. He complained of great pain in the epigastrium and of intense thirst. He was given ice to suck, Vichy water by the mouth, and nutrient enema with brandy.

Dr. Clive Riviere, who saw him in consultation later in the day, advised bismuth carbonate made into a paste with paraffin by the mouth, sodium bicarbonate in albumin and water by the mouth, and in the enemas in view of the possibility of acidaemia. The bismuth and paraffin, of which a drachm was given four-hourly, seemed to be very beneficial in easing pain and nausea. He slowly recovered without any serious complication beyond some left-sided dry pleurisy which subsided and some nocturnal delirium. The highest temperature was 101.8°. The back of the throat was white and corroded, but gradually cleared. When I last saw him, a month after the occurrence, he was up and had been out and was taking semi-solid food.

The fact that he had just taken a large meal and was immediately given an emetic, combined with his youth, accounts, I think, for his recovery. I have not seen him since, as he left the neighbourhood, but I have heard recently that he is much debilitated, can only take semi-solid food, and has to have a bougie passed daily.

London, W. HOWARD STRATFORD, F.R.C.S.Edin.

Reports of Societies.

THE OXFORD OPHTHALMOLOGICAL CONGRESS.

THE eleventh annual meeting of the Oxford Ophthalmological Congress was held at Oxford on July 14th, 15th, and 16th. The proceedings took place in the Department of Human Anatomy of the Museum, kindly lent for the purpose by Professor Arthur Thomson, whilst members once more enjoyed the hospitality of Keble College. The attendance was large and included a number from overseas, prominent amongst whom were Professor Harvey Cushing, Dr. Luther C. Peter (Philadelphia), Professor Van der Hoeve (Leyden), Professor Holth (Christiania), Dr. S. Lewis Ziegler (Philadelphia), and others. The chief features of the meeting were, on the first day a discussion on perimetric methods, and on the second day the Doyne Memorial Lecture.

Perimetric Methods.

The discussion was opened by Dr. LUTHER C. PETER, who limited his remarks to the newer methods of perimetry and the types of cases for which they were especially adapted. After pointing out the inefficiency of the ordinary perimeter in recording changes in the central zone, the opener proceeded to discuss the various modern instruments specially adapted for this purpose. Dr. Peter then urged a change in the nomenclature from linear measure in millimetres to angle subtended in degrees or minutes, and discussed the size of the test object, especially for colour studies. The size for the central zone should subtend an angle of half a degree and that for the peripheral zone one degree. The special methods required for the study of bilateral central scotomata were (*a*) by making use of muscle sense, and (*b*) by the speaker's method of combining perimeter and campimeter.

A good discussion followed, in which the following took part: Professor VAN DER HOEVE, Mr. A. H. SINCLAIR (Edinburgh), Dr. MARX (Leyden), Professor HARVEY CUSHING,

Professor S. HOLTH, Mr. E. H. E. STACK (Bristol), Lieut.-Colonel R. H. ELLIOT (London), Dr. A. MAITLAND RAMSAY (Glasgow), Major L. E. J. LISTER, I.M.S., Mr. T. HARRISON BUTLER (Leamington Spa), Mr. BURDON COOPER (Bath), Mr. E. E. MADDOX (Bournemouth), Mr. P. G. DOYNE (London).

Dr. MARX showed an ingenious test-object for use with his perimeter, consisting of a small ball moved by an electro-magnet applied to the back of the screen, whilst Dr. HOLTH exhibited three patterns of a chord pocket perimeter of his own design.

The Doyne Memorial Lecture was delivered by Mr. F. RICHARDSON CROSS of Bristol, the subject being the nerve paths and centres concerned with sight. The lecturer, after paying a fitting tribute to the founder of the congress, the late Robert Walter Doyne, dealt in a comprehensive manner with the visual tracts and centres, comparing certain areas with the homologues in monkeys, birds, and reptiles, etc. A number of interesting slides were shown of the fields of vision in quadrantic hemianopia and cases of injury of the occipital cortex, bearing out the more recent views on the relationship between the peripheral visual fields and the centres in the occipital area. At the conclusion the Doyne Memorial Medal for 1920 was presented to Mr. Cross.

Papers were read by Mr. A. S. PERCIVAL (Newcastle-on-Tyne) on light sense, with some practical deductions drawn from its consideration; Professor VAN DER HOEVE on eye symptoms in tuberous sclerosis of the brain—an extremely interesting and valuable contribution to the present knowledge of the disease. Mr. MAURICE BARTON, an examination of the eyes of pit ponies, particularly with reference to miners' nystagmus. Mr. A. HUGH THOMPSON read a paper on physiological and glaucoma cups, in conjunction with one by Dr. RAYNER D. BATTEN, entitled "Premonitory symptoms of glaucoma: (1) Deep tension; (2) excavation of the optic disc." Dr. S. LEWIS ZIEGLER'S paper on the ocular menace of wood alcohol poisoning, attracted considerable attention, as also did a fascinating contribution by Dr. LOUIS SAMBON, entitled "Ancient eye instruments." All the papers were discussed, though, owing to the length of the programme, less fully than the subjects merited.

On the afternoon of the second day the Congress adjourned to the Eye Hospital, where short papers were read on operations, new instruments and ophthalmic apparatus, as follows: Lieut.-Colonel H. HERBERT, on the indications of glaucoma operations, four illustrative cases being shown. Professor S. HOLTH described a new punch-forceps sclerectomy for glaucoma. Mr. N. C. RIDLEY showed a patient whose orbit he had successfully restored by a plastic operation, and who was consequently able to wear an artificial eye. Dr. RAYNER D. BATTEN demonstrated the hydrophthalmoscope on a patient, and indicated its value clinically. Mr. A. S. PERCIVAL showed some simple devices for estimating the light sense. All the contributions were freely discussed.

Instruments and Apparatus.

In the Scientific Museum, which was open during the Congress, Mr. E. H. E. Stack (Bristol) showed a simple and ingenious motor trephine which should prove of considerable aid in the operation of trephining. Mr. R. J. E. Hanson, O.B.E. (London), showed a well designed ophthalmic bureau and equipment for naval oculists serving at either a royal naval hospital, a dépôt, naval base, or fleet at sea, and also drawings and models of improvements in gun-sighting telescopes, theodolites, and microscopes. Mr. E. E. Maddox (Bournemouth) showed (1) an artificial epistaxis knife, (2) illuminated forceps, (3) the "V" test for astigmatism. Mr. N. C. Ridley showed a new cataract knife. In a separate room Professor Barr's optophone, which has recently attracted so much attention, was demonstrated to members. In the Commercial Museum instruments, apparatus, lenses, and books were on view during the meeting.

At the close of the proceedings on the first day a general meeting was held, after which members with their friends met at Queen's College for tea, the Rev. S. B. Cronshaw acting as host. The official dinner of the congress took place on Thursday evening, July 15th, in the hall of Keble College.

PATHOLOGY OF ACCIDENTAL HAEMORRHAGE.

AT a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine, held on July 8th, with the President, Mr. J. D. MALCOLM, in the chair, Mr. GORDON LEY read a paper on the pathology of accidental haemorrhage. The first part of his paper dealt with the literature of the subject, which he reviewed at some length. He next read pathological details of the uteri of three cases of accidental haemorrhage, of the kidneys of three cases, and of the liver of two cases. In order to prove his point he had used as controls five uteri removed, *ante* or *post mortem*, for rupture or for conditions apart from accidental haemorrhage causing death.

He found in all uteri leucocytic infiltration both of the decidua and of the myometrium; this was not greater in the cases of accidental haemorrhage than in the control uteri. Granules of fat in the interstitial cells of the connective tissue were not more numerous in the accidental haemorrhage cases than in the control cases. He found in the cases of accidental haemorrhage extensive albuminous oedema of the myometrium in the outer part of the wall, in the body, the lower uterine segment, and the cervix; in the control cases there was present an oedema of the stretched lower uterine segment only. In the cases of accidental haemorrhage there were, throughout the myometrium of the body, lower uterine segment, and cervix, focal areas of degeneration and necrosis and haemorrhage. The distribution of these areas of necrosis was such that they could not be attributed to the haemorrhage. In the control cases, save for a slight vacuolar degeneration of some cells in the myometrium, there was no degeneration and necrosis except in the stretched, oedematous, and haemorrhagic lower uterine segment; haemorrhage was confined entirely to the margin of ruptures and to the stretched, oedematous, and ruptured lower segment. He found in the liver and in the kidneys of the cases of accidental haemorrhage parenchymatous and fatty degenerations of varying degree and extent. In one of the control cases the uterus had been suddenly mechanically stretched by an extensive intrauterine haemorrhage, the result of a mechanical separation of a placenta praevia followed by the bringing down of a leg, which had prevented the blood appearing externally. In this case there was no haemorrhage or necrosis in the wall of the uterus; thus the occurrence of these phenomena in cases of accidental haemorrhage could not arise from the uterine distension.

The conclusions he formed were that accidental haemorrhage was the result of a toxaemia of the same nature and probably the same as that causing eclampsia. This toxaemia produced the focal necroses and the haemorrhages in the myometrium. The haemorrhage resulted in separation of an area of the placenta which in turn caused the opening up of uterine sinuses and copious intrauterine haemorrhage.

Dr. T. W. EDEN said that the mechanical theory of accidental haemorrhage could not be reconciled with the focal necroses found. The investigation threw a further light on the toxaemias of pregnancy, of which pernicious vomiting and eclampsia were accepted examples—to which accidental haemorrhage could apparently now be added. It was curious that women with accidental haemorrhage were not more ill.

Dr. HERBERT SPENCER congratulated Mr. Gordon Ley on his paper, but in view of the small number of cases described the title seemed somewhat ambitious. Albuminuria was not a constant symptom in accidental haemorrhage and decidual changes were known to be variable. He thought that more evidence was necessary before the toxaemia theory could be accepted.

Dr. BRIGGS had collected 32 cases; albuminuria was not a constant feature, and in many cases improvement followed without treatment for toxaemia.

In reply, Mr. GORDON LEY said that in a previous paper he had described a clinical investigation, in which 84 per cent. of cases were associated with albuminuria, and he had received from colleagues accounts in which the lowest percentage of this association was 60. He suggested that the bulk of cases without albuminuria were probably cases of lateral placenta praevia.

Dr. J. D. BARRIS showed a specimen of primary carcinoma of the Fallopian tube.

The patient was aged 55 years, and had had three children, the last thirty years ago. The menopause occurred two and a half years ago. She was well until November, 1919, since when she suffered from almost continual vaginal bleeding and some loss of weight. There was no history of watery discharge. Panhysterectomy was performed on May 18th, 1920. In the recent state the right tube measured 10 in. by 12 in., and contained altered blood and papillomatous growths. The uterus

and cervix were healthy, but minute secondary nodules were scattered beneath the peritoneal surface in the anterior aspect of the uterus and at the junction of the left tube to the uterus. Microscopic section showed the tumour was a columnar-celled papillary carcinoma.

Dr. HERBERT SPENCER said that in addition to the four cases already published he had recently met with a fifth case of primary cancer of the Fallopian tube at the necropsy on a patient who died of multiple secondary growths in the peritoneum.

Mr. ALFRED RICHARDSON showed a specimen of a fibroma of ovary removed from a girl of 16. The tumour was accidentally discovered, the patient having no symptoms of its presence. Noteworthy features were the size of the tumour (5 in. by 4 in.) and its peculiarly warty surface, some of the papillomatous processes being separated from each other by fissures 1 in. to 1½ in. in depth.

Dr. SPENCER had never seen such an extensive mass of fibrotic warts, nor removed an ovarian fibroma from such a young patient. In view of her age he would suggest that sections should be cut in several places in order to exclude sarcoma. The sections under the microscope certainly appeared to be those of a fibroma.

Reviews.

THE HEART BEAT.

The Mechanism and Graphic Registration of the Heart Beat,[1] which Dr. THOMAS LEWIS has just published, is nominally a second edition, but it is more—it is a new book with a new title. The outstanding features of this work are the thoroughness, the comprehensiveness, and the caution which Dr. Lewis has shown in all his statements. No theory is accepted which is not abundantly supported by facts. For the first time we have a complete and adequate presentation of the position by one of the greatest living authorities. The bibliography, which contains 801 references, is remarkably full, and is further evidence of the exhaustive care which characterizes all Dr. Lewis's work.

The value of graphic methods in the investigation of the mechanism of the heart is demonstrated in a remarkable manner. A very fine representative series of records, accurately reproduced on glazed paper, is one of the striking features. The series includes arterial and venous tracings and electro-cardiograms; in many instances the three are combined. The whole ground is covered. The general scheme is to correlate the clinical aspect of arrhythmia with purely experimental work. Much of what is set out is an epitome of work already published in detail in *Heart* and other journals.

Dr. Lewis deals first with the histology of the heart, and there is an excellent chapter on the minute structure of the sino-auricular node, the *a-v* node, and the Purkinje system. Then the electro-cardiograph and polygraph are described and a valuable analysis is made of the curves obtained by these instruments. Fig. 10 would have been improved if it had been divided throughout into fifths of a second. This is the common standard time-marker used by most clinical investigators, and this diagram intended to represent the curves of pressure in the carotid, aorta, left ventricle, and right auricle, together with the jugular and electro-cardiograph curves, would have been simplified and more easily brought into line with the ordinary records if, in addition, ordinates representing fifths of a second were inserted.

Chapter V is one of the most interesting. It is devoted to the normal pacemaker of the mammalian heart. The first portion of the heart to contract becomes relatively negative to every other portion. By utilizing this fact the site of the pacemaker was localized, and it was demonstrated that it was the sino-auricular node. Further experiments of a different nature showed that it was the upper end of the node which was most active, and that the impulses originate in this region.

Chapters X, XI, and XII deal with the analysis of disordered mechanism as shown by the arterial, venous, and electrocardiograph curves. All students of cardiac arrhythmia will find great help from Chapter X, dealing with arterial pulse curves or arteriograms. The value of simple records taken from the radial or carotid artery is not yet adequately recognized, though Wenckebach showed in 1904, in his book on arrhythmia of the heart, how much could be gained by a careful analysis of radial records.

Lewis points out how to differentiate between curves showing a dominant rhythm and those in which the dominant rhythm is absent (auricular fibrillation). From a radial tracing alone it is usually possible to determine the site of the dominant rhythm whether at the normal pacemaker or some other point in the heart, and still further to recognize the nature of a transient or recurrent disturbance of this rhythm. The method employed is that of "spacing," and it is fully demonstrated in a series of records. This matter is one of great importance to practitioners, because it is not a matter of any difficulty to obtain a good tracing of the radial pulse—nor is it a long or tedious business—while the information which can be gained in this way may be of the greatest value.

The profession is slowly becoming familiar with the term "auricular fibrillation." A clear conception of the condition is essential in the management of heart disease. This subject is fully and adequately dealt with both from the clinical and from the experimental side. Its close relation to auricular flutter is pointed out. There is still no finality as to the essential nature of auricular flutter, but Dr. Lewis leans to the view that the simple "circus movement" is the true explanation of flutter, and he is inclined to accept the hypothesis advanced by Mines and Garrey, that fibrillation is not due to innumerable foci in the auricular wall giving many and irregular stimuli, a percentage of which reach the ventricle through the junctional tissues, but that the fundamental error is one of varying conducting power in the muscular fibres and strands of the auricular wall: "Whereby the excitation wave is broken up and travels along sinuous and varying paths, re-entering fibres through which it has already travelled." The result is an auricle in a state of passive diastole incapable of any co-ordinate systole. The wall is tremulous and flickering and without any driving power. Stimuli reach the ventricles irregularly and give rise to a disorderly rhythm.

The book contains several chapters on premature beats, auricular, ventricular, and nodal in type, and also on the various forms of paroxysmal tachycardia, but it is impossible to refer in detail to all the interesting problems discussed. There is a chapter on syncope, dealing with standstill of the entire heart, slowing of the heart with lowered blood pressure, heart-block, ventricular fibrillation, and syncope due to extreme acceleration of the ventricular rate. In another chapter Dr. Lewis deals with the heterogenetic contractions of the heart, in which he emphasizes the view that the heart is capable of originating contractions of two vitally different types, while admitting that this conception is at present lacking complete experimental proof.

To everyone in the habit of using either a polygraph or electrocardiograph this book is essential. It will more than repay careful study, and its perusal will act as a stimulus and an incentive to the further investigation of patients suffering from cardiac disorders. It is a book, however, to be read not only by the cardiologist, but by all who wish to be in touch with the solid progress in this branch of medicine which has been made during the last few years, with the result that prognosis has become more certain, diagnosis more sure, and treatment more sane.

[1] *The Mechanism and Graphic Registration of the Heart Beat*. By T. Lewis, M.D., F.R.S., F.R.C.P., D.Sc. London: Shaw and Sons. 1920. (Double cr. 8vo., pp. 462; 349 figures. 47s. 6d. net.)

SIR WILLIAM OSLER.

THE second and third numbers of the second volume of the *Annals of Medical History*,[2] which are dated June and September, 1919, but were greatly delayed by the printers' strike in New York, have recently been published. The articles in the second number to which most readers will naturally turn first are those on the late Sir William Osler, and of these that on "William Osler the Man," by Professor Harvey Cushing, who has appropriately been chosen to write his life, is perhaps the most charming; this expression of personal knowledge and affection contains a number

[2] *Annals of Medical History*. 1919, vol. ii, Nos. 2 and 3. Edited by F. R. Packard. M.D. New York City: P. B. Hoeber.

of letters from the late Regius Professor, and is an expansion of an obituary appreciation contributed to the Boston *Evening Transcript* of January 3rd, 1920. Dr. Howard Kelly's graceful tribute, Dr. Ruhräh's account of Osler's influence on medical libraries in the United States of America, and Dr. Fielding Garrison's kindly critique of Sir W. Osler's contributions to medical literature, were written before Sir William's death. Dr. Garrison's dictum that the main lesson thus conveyed to our profession may be summed up in the title of one of his earliest addresses, "Aequanimitas," will meet with general acceptance, as will his feeling that few have so fully lived up to the ideals of the Anglo-Saxon race. Dr. Garrison also contributes an appreciation of the late Dr. A. Jacobi, who died in July, 1919, on the verge of 90, and in addition to having "pressed the button which set the pediatric clinic in motion," is said to have invented and used a laryngoscope some time before the appearance of Garcia's instrument. Sir D'Arcy Power's article on the Oxford physic garden contains portraits of John Ward's friends, and there is an interesting account of Lord Lister, whose portrait appears on the cover, by his former house-surgeon, Sir StClair Thomson.

The cover of the third number bears the portrait of Dr. W. P. C. Barton (1786-1856), a pioneer in American naval medicine, whose varied life is sketched by Captain F. L. Pleadwell, U.S.N.; this article also appeared earlier in the *Military Surgeon* for March of this year. Dr. Burr gives an interesting description of "J. P. Marat, Physician, Revolutionist and Paranoiac," of the political type who had delusions and was a megalomaniac. An article by Dr. J. Foote about "Ancient Poems on Infant Hygiene" is followed by Dr. J. Ruhräh's appreciation of "Walter Harris, a Seventeenth Century Pediatrist," which supplements the contribution to the Osler Anniversary Volume on "Some 17th Century Writings on Diseases of Children," by Dr. G. F. Still, who remarks that posterity has not confirmed Sydenham's high opinion of Harris's work. Dr. Roy Moodie provides some new observations on palaeopathology, and Dr. Rosenbloom writes on Dr. H. Bence Jones.

IMMUNITY.

THE life-work of the late Professor Metchnikoff, who died in the summer of 1916, was to establish the importance of phagocytosis in the natural reaction to infectious disease. The cellular theory of immunity was his child; he first wrote about it in 1882, published a short book on it in 1892, and in 1901 wrote an epoch-making account of it in a large and exhaustive work on immunity in infective diseases. The great importance of the cells of the body in the defence of the organism against infection was being overlooked, or perhaps rather we should say minimized, at that time by the loud-voiced German school of pathologists, who were committed to the humoral theory of immunity wherein the fluids of the body received all the credit that should properly have gone to the cells secreting them.

But the battle between the cellular and the humoral pathologists, important as it was in the closing decade of last century, is long over, and has gone in favour of the French school and its leader Metchnikoff; the importance of humoral pathology is duly recognized, but recognized to be subsidiary. Quite recently Professor BORDET of the Brussels Pasteur Institute has written an exhaustive account of the modern views of immunity and their development in his *Traité de l'Immunité dans les maladies infectieuses*.[3] No author better fitted by training and experience to write a book on immunity in infectious diseases could have been found; the subject is one at which he has been working from the experimental side for thirty years. Professor Bordet's object has been, as he says in his preface, to contribute to the popularization of the fundamental notions of immunity; he has reviewed the whole subject from a historical and synthetical point of view, and aims at being clear without being incomplete. Temperamentally he prefers facts to theories, and he displays great caution in theorizing and drawing general conclusions from data that are necessarily still incomplete. How wholly different a mental attitude from that inspiring Ehrlich's well known side-chain theory and its application to immunity—the theory that was to foresee and explain everything, yet now, having done no more than inspire a great deal of the experimental work that led to its undoing, has been very generally relegated to the limbo whither so many hasty generalizations by men of science have preceded it.

Professor Bordet's treatise is divided into four parts. The first of these gives a general review of infection and immunity, written on historical lines, and setting out the problems that nowadays present themselves for solution to the experimental bacteriologist or physiologist engaged in the study of immunity. The second part deals with cellular immunity; its successive chapters are concerned with such things as intracellular digestion, inflammation and phagocytosis, the phagocytosis of microbes, and the factors that aid or oppose the process of phagocytosis, particularly the influences exerted by the fluids of the body. This leads on to the discussion of humoral immunity; the facility with which the phenomena of humoral immunity can be investigated by slide and test tube is pointed out, as are the fallacies that often attend the transference of results obtained *in vitro* to the case of the living organism. In this section of the book will be found a full-dress account of toxins and antitoxins, antigens and antibodies, agglutinins, haemolysins, alexins, the disputed specificity of antibodies and their reactions, and some sixty pages on anaphylaxis, a word that at the present time takes the place of the blessed word Mesopotamia in medical literature more often than any other.

The fourth part of the book is given to the practical applications of modern theories of immunity. In it are discussed the reactions of the organism as a whole. Its first chapter summarizes the comparative values of the organism's methods of defence, the counter-attacks put up by pathogenic bacteria, the significance of incubation periods and late manifestations, and the duration of acquired immunity. The second chapter deals briefly with the immunity observed in various bacterial and other infective disorders, mainly in the case of man and including malignant disease.

Professor Bordet writes clearly and in a temperate spirit, with a fully adequate knowledge of the vast literature of the subjects with which he deals, and a highly judicial pen. His chapters teem with references to the practical applications of the science of immunity to medical and surgical questions of importance; herein they contrast not a little with the pages of Metchnikoff's great work, in which the observations recorded were rather those of a general biologist at work in a biological laboratory. Such a difference is natural, and illustrates the change in point of view that has come with the rapidly advancing knowledge and the generalization of experimental work in all civilized countries that have been so marked a feature of the last quarter of a century. Professor Bordet's book will long serve as a milestone to mark the present stage of our knowledge and the problems that seem at the moment most urgently in need of solution at the hands of the experimental pathologist and bacteriologist. It may be recommended very warmly to readers of this class; but it combines fullness with clearness of expression in so conspicuous a manner that it should reach a far wider circle of readers among scientific men and students.

[3] *Traité de l'Immunité dans les maladies infectieuses.* By Dr. Jules Bordet, Directeur de l'Institut Pasteur de Bruxelles et Professeur à l'Université. Paris: Masson et Cie. 1920. (Roy. 8vo, pp. 728. Fr. 40 net.)

NOTES ON BOOKS.

DR. FOX'S pamphlet on *The Care of Sane Epileptic Children*[4] gives an interesting account of the advantages presented by the colony system in their treatment, and is largely based on the author's experience as medical superintendent at Lingfield, where half the 330 patients are under the age of 16. Epileptic children are not accepted at this residential colony unless they are likely to benefit by the teaching provided, and a general sketch of this education is given. Dr. Fox concludes that the value of drugs, even of the bromides, in epilepsy is uncertain, and requires further investigation along agreed lines. This pamphlet contains many useful practical suggestions for those who have to deal directly with epileptic children.

[4] *The Care of Sane Epileptic Children.* By J. Taylor Fox, M.A., M.D. London: J. Bale, Sons, and Danielsson, Ltd. 1920. (Demy 8vo, pp. 39. 1s. 6d. net.)

The value of a subtitle to a book is rarely so obvious as in the instance of the Rev. STEWART A. MCDOWALL'S *Beauty and the Beast: An Essay in Evolutionary Aesthetic*;[5] for those attracted to it by a memory of Madame Villeneuvre's charming nursery story, *La Belle et le Bête*, may not only be disappointed but sorely puzzled what to make of this philosophic thesis. It is true that the first few lines of the introduction, "Are we to look at the beautiful with our feet firmly planted on the natural, or are we to look at the natural from the apparently precarious height of the beautiful? This, after all, is the dilemma of aesthetic, slow though men have been to realize it," will provide the casual reader with food for reflection, whether or not he is worthy. The author expands Croce's statement that beauty is expression in the following manner: "God is love; reality is love. Love is relationship. Beauty is the expression of that relationship." On the other hand, ugliness is the aesthetic or theoretical aspect of sin; in its practical aspect sin is uneconomic, unmoral.

A Corner-stone of Reconstruction,[6] by Four Chaplains to H.M. Forces, is a plea for social purity among men. It is a concisely worded handbook, written by men with a practical and sympathetic knowledge of humanity. It contains five short chapters and an appendix. The first chapter deals with a clear and able restatement of the moral standard. The second contains practical hints for those who wish to conduct social purity work; this chapter is the best in the book, and the authors have rendered mankind at large a very real service in writing it. The following chapter contains four specimen addresses, which were at various times delivered to large bodies of troops. These deal with the practical aspect and issues of social purity, the theme being developed on the usual lines. The discussion of the medical side of the question, in the fourth chapter, might have been omitted, especially as all necessary information on the subject is now provided by the State in a form easily understood. To sum up, this is a good book, sincerely and temperately written. It shows only those faults which appear inseparable from the ecclesiastical outlook on this subject.

Dr. JOHN O. TUNSTALL[7] has recently published a collection of short poems on various subjects, and so has joined the band of medical poets of whom the present Laureate is the outstanding example. Of these poems the most successful are those dealing with the country, particularly those about the English Lakes, which breathe a true love of nature. The longest is a sacred poem entitled "God's Plan," of which Part I only is given; three further parts in process of composition are reserved for future publication, when the whole story of man's creation and salvation will be told.

[5] *Beauty and the Beast: An Essay in Evolutionary Aesthetic.* By Stewart A. McDowall, B.D., Chaplain and Assistant Master at Winchester College. Cambridge University Press. 1920. (Pp. 93. 7s. 6d.)

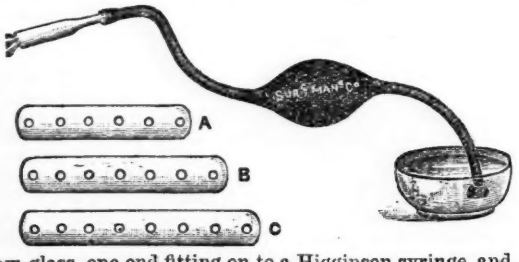
[6] *A Corner-stone of Reconstruction.* A Book on Working for Social Purity among Men. By Four Chaplains to the Forces. London: Society for Promoting Christian Knowledge; New York: The Macmillan Company. 1919. (Fcap. 8vo, pp. xi + 156. 3s. 6d. net.)

[7] *Poems.* By John O. Tunstall, M.D.Lond. Birmingham: Cornish Brothers, Ltd. 1920. (Cr. 8vo, pp. 124. 6s. net.)

APPLIANCES AND PREPARATIONS.

A Combined Throat Irrigator and Spatula.

WE have received from Miss Kathleen Taylor, Guy's Hospital District Nurses' Home, a specimen of a small appliance devised by her, and styled the "Barton combined throat irrigator and tongue depressor nozzle." It is made of



hollow glass, one end fitting on to a Higginson syringe and the other being perforated like the "rose" of a watering can. The object of this device is to allow the tongue to be depressed with the same instrument with which the throat is irrigated, and thus to afford a clear view of the affected part. It is made in three sizes, (*a*) infants, (*b*) children, and (*c*) adults, by the Surgical Manufacturing Company, Ltd., 85, Mortimer Street, W.1.

UNIVERSITY FINANCE.

PROSPECTS OF INCREASED GOVERNMENT AID.

A YEAR ago the Treasury appointed a University Grants Committee to inquire into the financial needs of university education in the United Kingdom and advise the Government as to the application of any grants that might be made by Parliament towards meeting them. The setting up of this committee gave concrete shape to the Government's recognition that provision for the aid of University education must be increased and consolidated, and that this could best be done on the advice of a single body. The constitution of the committee, of which Sir William McCormick is chairman, was stated in our issue of January 10th last at p. 54, where an account was given of the sums voted by Parliament for the financial year ending April, 1920.

Stated briefly, the annual recurrent vote for universities and colleges in the United Kingdom was raised to £1,000,000, and a special non-recurring vote of £500,000 was made for special grants in aid of certain universities, colleges, and medical schools, to assist them to re-establish their work on a basis of unimpaired efficiency after the war. The annual sums allocated to the different institutions take the form of inclusive block grants to be expended at the discretion of the governing bodies, the grants being made by the Treasury.

The Government has lately had under consideration the question of increasing these grants in aid of university institutions, and a memorandum on the subject was submitted to the Chancellor of the Exchequer by the University Grants Committee. In a letter to Sir William McCormick, dated July 16th, the Chancellor announces the Government's decision. While the Government recognizes the vital importance of the work of the universities in the national life, no supplementary grant within the present financial year will be considered; but in preparing the Budget estimates for 1921–1922, and "subject to overriding necessities of national finance," an increase of the present grants in aid from £1,000,000 to £1,500,000 will be considered. This Treasury grant will be applicable only to such activities as are clearly of a university character. In general, the object is to secure the present activities of the universities on a sound footing before aid is given towards extensions and developments. The Chancellor authorizes the University Grants Committee, in submitting recommendations for future grants, to take into account, on certain conditions, various elements of new local support provided during the past two years. In addition to the grant-in-aid the Chancellor is prepared to consider the advisability of a further non-recurrent grant to assist the universities in meeting the grievance of those of their senior members who are precluded from benefiting to the full by the universities superannuation scheme.

Before advising as to the distribution of the grant, the Committee will consider the claims of the various institutions and consult with their respective authorities.

The Government's proposals were outlined in the House of Lords on July 21st by the Earl of Crawford. He said that the proposed grant to meet the grievance of senior members in respect of superannuation, expressed the Government's desire to mitigate a real and tremendous personal hardship, with which they fully sympathized. The object of his main announcement, added Lord Crawford, was not merely to help the universities as such but to stimulate the benefactions of others. He expressed a statesmanlike belief in the need for preserving at all costs the special and intimate character of each university. Except in very rare instances he did not think uniformity desirable. In his opinion standardization was not democracy. There should be the greatest variation of methods, and indeed of ideals as well, in university life. The Marquess of Crewe, who followed, did not think the House need be too greatly alarmed by the use of the phrase "overriding financial necessities," which he took to represent the habitual caution proper to the Treasury.

THE Council of the University of Paris has approved of a proposal to grant two new diplomas within the Faculty of Medicine, one in puericulture and the other in radiology and radiotherapeutics.

THE OSLER MEMORIAL.

AT a meeting attended by a large number of representative members of the University of Oxford and of the medical profession, it was determined to raise a Fund to the memory of Sir William Osler, and it was resolved that in view of the intimate association of his life-work with the study of the origin and prevention of disease, the most appropriate form of memorial would be an Osler Institute of General Pathology and Preventive Medicine. A large General Committee has been formed and a smaller Executive Committee, consisting of the Very Rev. Sir T. B. Strong, Dean of Christ Church (now Bishop of Ripon), Chairman; Sir Herbert Warren, President of Magdalen College, Oxford, Vice-Chairman; Sir Archibald Garrod, Osler's successor as Regius Professor; Dr. Arthur Thomson, Professor of Human Anatomy, and Dr. C. S. Sherrington, Waynflete Professor of Physiology in the University of Oxford; together with the Honorary Treasurer, Mr. A. P. Dodds-Parker, Surgeon to the Radcliffe Infirmary; and the Honorary Secretary, Dr. J. A. Gunn, Professor of Pharmacology in the University. This Executive Committee has now issued the following appeal:

At a public meeting held in Oxford on March 6 it was decided to issue an appeal for funds to erect an Osler Institute of General Pathology and Preventive Medicine, for the purpose of commemorating the distinguished services of the late Sir William Osler, Bart., Regius Professor of Medicine in the University of Oxford.

Such a memorial would have been appreciated by Osler himself, for, beginning his life with his chief interests directed towards Pathology, he ended with an enthusiastic belief in the future of Preventive Medicine. It would be a fitting expression of the world's indebtedness to him alike as a physician, a teacher and an investigator, while it would at the same time be, what he himself would greatly have valued, of practical and daily utility to the advance of medical science.

Osler was a great and good physician, but he was more than this, and for future generations of students there could be no better example. He recognized no breach between science and the humanities. His influence on the progress of medicine was profound, not only from his own contributions to knowledge, but from his genius in promoting, distributing, and organizing it. Combining with this a wide knowledge of human thought, a constant striving for the welfare of his fellow men, an unlimited capacity for friendship, a loftiness of ideal and a singular fortitude in his outlook on life, he justified the universality of those tributes paid to his memory which are still fresh in men's minds.

A member of a distinguished Canadian family, he had the unique experience of exercising his wide and beneficent influence in Canada, in the United States, and in England, in each of which countries he was successively a professor of medicine; and few men can have done more to foster and consolidate friendship between them. This international character of his career and the range of his knowledge and sympathies merit a conspicuous and permanent tribute, for the remembrance of Osler's life-work is singularly fitted to bring home to the minds of all—whether our own undergraduates, Rhodes Scholars, or Foreign Students—the fact that knowledge knows no boundaries.

For these reasons we believe that the proposed memorial, associated with the University in which for fifteen years Osler occupied such an honoured position, will do something more than carry on what was the central object of his life—the alleviation and prevention of disease; it will stand as a permanent tribute to nobility of character, breadth of sympathy, and greatness of achievement.

The ultimate character of the memorial must, of course, depend on the amount and nature of the response to this appeal. The aims and objects set forth lead us to hope that it may be a generous one, and we earnestly solicit your help. Subscriptions should be sent to the Honorary Treasurer, Mr. A. P. Dodds-Parker, Holywell, Oxford, or to the National Provincial and Union Bank of England, 91, High Street, Oxford.

The patrons of the appeal are the Prince of Wales, the United States Ambassador in England and the British Ambassador at Washington, the High Commissioner for Canada, and Earl Curzon of Kedleston, Chancellor of the University of Oxford. We cannot reproduce the whole of the long list of the members of the General Committee; it will suffice to say that it contains representatives of all the universities of this country, as well as the Presidents of the Royal Colleges of Physicians and Surgeons of London and Edinburgh, of the Ministry of Health (Sir George Newman), of the Army Medical Service (the Director-General, Sir John Goodwin). Among other members are Sir Alfred Keogh, Rector of the Imperial College of Science and Technology, and such representatives of general culture as the Earl of Crawford, Sir Arthur Evans, and Mr. Rudyard Kipling. The British Medical Association is represented by its President, Sir Clifford Allbutt, its President-elect, Dr. David Drummond, and by an ex-President, Dr. William Collier.

HEALTH OF LONDON.

REPORT OF MEDICAL OFFICER TO THE LONDON COUNTY COUNCIL.

THE report for 1919 of Dr. W. H. Hamer, London County medical officer of health, which was issued last week, follows in general the lines of the previous reports, and includes the school medical officer's report; in addition, one-third of the volume is given to an appendix in which is submitted a report by Dr. F. N. Kay Menzies, on the treatment of tuberculosis in London.

Population of London.

The year under review was a period of transition from the war conditions of 1918 to almost normal conditions towards the end of 1919; by the middle of that year demobilization had so far counterbalanced repatriation of war refugees and of American and Colonial troops that there was a net addition to the London population of over 400,000. According to the Registrar-General's estimates, based on the National Register of 1915 and on information obtained in connexion with food rationing, it appears that the 1919 population of London was about 20,000 greater than that of 1914. Dr. Hamer remarks, however, that the estimate for 1914 is probably too low; reckoning on the basis of the children scheduled for elementary education in 1911 and 1914, he concludes that the total population in 1914 must have been about the same as the Registrar-General's estimate for 1919—namely, 4,540,062. If the food registration figures be taken to furnish an exact basis of calculation, the deduction of those on active service makes the resident population of the county about 80,000 less in the middle of 1919 than before the war. The scarcity of housing accommodation appears to be due not to increased population, but to diminution of building and to increase of marriages, which were 17,000 more from 1915–18 than from 1911–14. The estimated birth rate was 18.2 per 1,000 in 1919, as compared with 16.0 in 1918. The death rate was 13.6, or 5.6 less than that of 1918; in spite of 5,000 deaths attributable in 1919 to influenza, the total deaths, 59,114, were fewer than those in any previous year since 1856.

Infectious Diseases.

The prevalence of infectious disease, though still below the average, was not so exceptionally low as in the preceding three years. Several cases of small-pox appeared, but isolation of cases and contacts successfully limited the spread of infection. Diphtheria notifications exceeded those of any year since 1902. Scarlet fever has steadily increased since 1917, and Dr. Hamer remarks that there is every appearance of the approach of another period of greater prevalence of this disease.

In spite of the passage through London prior to demobilization of 400,000 persons drawn from all parts of Europe, typhoid fever showed in 1919 a still further decline; this accords with the prediction made in the annual report for 1914. While it is possible to ascribe to preventive inoculation the diminution in mortality among soldiers, such an explanation cannot hold in regard to that found among civilians. Dr. Hamer reviews the behaviour of typhoid fever in London since 1870; experience in this area indicates that

first and foremost improvement of water supplies, and following upon that improvement of shellfish and fish supplies, have been the cause of the great decline of typhoid fever.

The outbreaks traceable to fish and shellfish are summarized, and evidence having epidemiological bearings is quoted from the Report of the Departmental Committee on Inshore Fisheries (1914). It is pointed out that as a result of the revival of the fishing industry there is likely to be an increased sale of fish and shellfish coming from remote and possibly polluted areas; inspection and control are called for, in order that typhoid may continue to be reduced. The report contains critical notes on the causation

of typhoid fever and the epidemiological part played by Eberth's bacillus; and in his comments in the sections dealing with tuberculosis, and with influenza and cerebro-spinal fever, poliomyelitis and polioencephalitis (including encephalitis lethargica), Dr. Hamer again emphasizes "the need for a truer and more comprehensive epidemiology."

Administration of Midwives Acts.

Of 5,000 midwives having London addresses 450 to 500 only are in actual practice there. Infirmary cases being excluded, some 44,000, or 54 per cent. of the total births in London were attended by midwives. There were notified 26 slight, and 13 more serious infringements of the rules of the Central Midwives Board. Medical help was required by midwives in 5,347 cases, compared with 3,159 in 1917, and 2,738 in 1918; in part the increase is attributable to the fact that in January, 1919, the Council became responsible for the payment of the fee of the medical practitioner called in. During the year 2,034 approved claims were received from 368 doctors, amounting to £3,047 2s., an average of 30s. per case. Deaths from puerperal fever were 68 among 141 cases notified by medical practitioners, 35 among 112 cases notified by certified midwives, and 47 among 81 other cases. There were notified 856 cases of ophthalmia neonatorum, 464 apart from the practice of midwives; of 841 cases of inflammation of the eyes occurring in midwives' cases, 392 proved to be ophthalmia neonatorum. The Metropolitan Asylums Board have arranged for in-patient treatment at St. Margaret's Hospital, St. Pancras, of infants suffering from this disease.

In connexion with hospital clinics for venereal disease, new patients numbered 20,908 in 1919, compared with 12,538 in 1918. It is hoped to provide during the present year in-patient treatment for infected pregnant women and for female children suffering from gonorrhoea.

Medical Inspection of School Children.

During 1919, 49.5 per cent. of children were found to have sound teeth, compared with 44.7 in the previous years; but the need for dental attention at early ages is shown by the fact that 16.4 per cent. of entrants had four or more decayed milk teeth. In contrast with the steady improvement which had occurred during the war, some deterioration of nutrition was observed in 1919. Of all the children examined 5.5 per cent. were under-nourished in 1918, and 6.1 per cent. in 1919; the change was specially noticeable among entrants, of whom 4.7 (boys) and 4.4 (girls) were ill-nourished in 1918, as compared with 6.1 per cent. (boys) and 5.7 per cent. (girls) in 1919. The children with serious malnutrition increased from 0.5 per cent. to 1 per cent. during the same period. The report contains a comparison of the conditions of those examined as twelve-year-olds in 1919 with those found among the same children when examined as eight-year-olds in 1915. While there had been marked improvement in cleanliness and nutrition, and in the teeth and the condition of the throat and ears, the condition of the heart and the vision had deteriorated, and there was an increase in the amount of deformity present; the deterioration was in all three cases greater in girls than in boys, and in the last case, that of deformity, was confined to the girls.

Examinations were made during the year of juveniles between 14 and 18 in receipt of unemployment pay. Of 673 boys and 45 girls examined, 318 and 16 respectively, required treatment. Of the boys 33 per cent. and of the girls 7 per cent. needed dental attention, and the condition of the teeth was very distinctly worse than that of "school leavers." The remains of rickety deformities were discovered in 4.6 per cent., compared with 1.8 per cent. of "leavers"; the explanation was thought to be that a special class of boys was being dealt with, who had failed to obtain or to continue in employment in competition with others because of their poor physique. It is noteworthy that refusals of examination were negligible in number, and that both pupils and instructors welcomed the visits of the doctor. It is calculated that about 30,000 children in elementary schools require, for varying periods, open-air education. To the Council's two open-air schools and one tuberculosis open-air school, two schools of each kind have been added; in this way it has been decided to provide 4,000 places altogether. It is hoped to accommodate 8,000 in open-air classes in parks and playgrounds, and in time 4,000 younger children in nursery schools; the needs of the remaining 14,000 older children may be met by a period spent in a holiday camp or school similar to the King's Canadian Camp School at Bushey.

Tuberculosis in London.

The remaining sixty-eight pages of the report are given to a report in which Dr. F. N. Kay Menzies describes the present provision for tuberculosis in London, and indicates the extensions and modifications which seem to be desirable. Since 1914 the Council has defrayed half the net cost of the borough council tuberculosis dispensaries; in conjunction with Dr. J. E. Chapman, of the Ministry of Health, Dr. Menzies has examined the working of the thirty-three dispensaries in the London area. For a detailed account the report must be consulted; we give here some of the most important findings.

In any given year the dispensaries deal with half only of the new cases of pulmonary tuberculosis, and one-third only of non-pulmonary cases. Patients with pulmonary tuberculosis seen for the first time were 18 per cent. and 10 per cent. more numerous in 1918 than in 1917 among the insured and non-insured respectively; similar increases were anticipated for 1919. Provision of additional branch dispensaries is required in two areas, and the appointment of nine new tuberculosis officers is advisable. Co-operation with local practitioners has very greatly increased during recent years. In some dispensaries there was great congestion of patients, due to the numerous cases (especially children) who were retained in attendance for observation, but in whom definite diagnosis had not been made. By the more intensive study of new cases, effort being concentrated on the quick attainment of diagnosis, and by the less timorous discharge of patients not proven, after such study, to be tuberculous, this congestion may, it is said, be diminished.

No doubt some of these discharged cases may ultimately break down from tuberculosis, but this unfortunate result will be more than counterbalanced by the increased efficiency which will result from the freeing of dispensaries from prolonged attendance of these observation cases. At present they overcrowd some dispensaries and render the observation either of themselves or others ineffective.

More extensive home visiting by dispensary doctors and nurses is recommended, and more complete co-ordination of the dispensary work and that of the borough public health departments is desirable. Dr. Menzies has surveyed the institutional accommodation available for resident treatment, and discusses the amount and character of the accommodation which should be provided for various classes of tuberculous patients. For cases requiring observation and for emergency cases (for example, those with haemoptysis or pleurisy) both diagnosis and treatment are preferably carried out in the large general hospitals; the provision is recommended of about 100 new beds. Many of the moderately advanced and chronic progressive cases have in the past either received no institutional treatment or occupied sanatorium beds, for which they were unsuitable; what to do with these cases forms one of the most difficult problems of the tuberculosis question. The view is here adopted that such patients must be given (1) a hygienic home; (2) suitable occupation, under medical supervision, in a factory or workshop; and (3) some means of supplementing their earning capacity during periods when they are undergoing institutional treatment; in areas where neither borough councils nor voluntary committees are able or willing to establish a factory or workshop under the supervision of the tuberculosis officer, the provision is foreshadowed of large institutions of a hospital-sanatorium type.

For advanced cases 250 beds are said to be immediately required; the problem is intimately bound up with that of existing Poor Law provisions.

Until, therefore, the question of the future administration and control of the Poor Law infirmaries is settled, or at all events until it is definitely decided that the Council is responsible for all patients suffering from advanced tuberculosis because they are tuberculous, and not the Poor Law authorities because they are destitute (as a result of tuberculosis), it is difficult to decide upon the best course to adopt.

For many reasons it is thought better to deal with these cases in large institutions, preferably those which receive also the moderately advanced and chronic cases. Arrangements of an entirely new character are judged to be necessary for cases of surgical tuberculosis in adults, for whom there is a serious dearth of accommodation.

THERE is at present an extraordinary increase in the number of medical students in Germany. Whereas in the summer term of 1907 there were 7,500 and in 1914 15,660, in 1919 their number exceeded 19,000. As the number of medical men in 1913 was 34,000, it may be calculated that there will be 48,000 in 1925. These figures do not include female students and practitioners, whose numbers are constantly increasing.

THE MEDICAL REGISTER: CHANGE OF ADDRESS.

Names of Practitioners who have not Responded to Inquiries.

AT the request of the General Medical Council we publish the following list of medical practitioners who have not responded to the inquiries of the Registrar of the General Medical Council made under Section 14 of the Medical Act, 1858. That Section imposes on the Registrars the duty to keep their respective registers correct. The following is the concluding portion of that Section:

> . . . and to enable the respective registrars duly to fulfil the duties imposed upon them it shall be lawful for the registrar to write a letter to any registered person, addressed to him according to his address on the *Register*, to inquire whether he has ceased to practise, or has changed his residence, and if no answer shall be returned to such letter within the period of six months from the sending of the letter, it shall be lawful to erase the name of such person from the *Register*, provided always that the same may be restored by direction of the General Council should they think fit to make an order to that effect.

It will be observed that Part I of the list contains the names of practitioners whose last known addresses were in the United Kingdom; this is divided into three sections: (*a*) Names of practitioners originally registered with the Registrar of the General Medical Council (England and Wales); (*b*) practitioners registered in the Colonial List; (*c*) practitioners registered in the Foreign List. Part II is a list of the names of practitioners originally registered in Scotland; and Part III of the names of those originally registered in Ireland. The list of names, each with one qualification and last known address, is as follows:

PART I.

(*a*) PRACTITIONERS ORIGINALLY REGISTERED WITH THE REGISTRAR OF THE GENERAL MEDICAL COUNCIL (ENGLAND AND WALES).

(Communications in regard to Lists I (*a*), (*b*), and (*c*), should be sent to the Registrar of the General Medical Council, 44, Hallam Street, Portland Place, London, W. 1.)

Addinsell, Augustus Whitehorn, M.B.Edin. 1883, 10, Curzon St., W.1.
Alexander, Harold George, F.R.C.S. 1914, c/o Grindlay and Co.
Ash, James, L.S.A. 1898, Salcombe, Devon
Atkinson, John Lancelot, L.S.A. 1886, Stoke Newington Rd., N.

Baber, Henry Aitkens, M.R.C.S. 1878, Chipping Sodbury
Baker, Frederick Relland, M.R.C.S. 1899, Brighton
Bates, Howard James, M.R.C.S. 1913, Birmingham
Bawden, John Clemence, L.S.A. 1893, Brixton Rd., S.W.2
Baylis, Kathleen (Miss), L.M.S.S.A. 1910, Ormskirk, Lancs
Beale, Thomas Miles, M.R.C.S. 1885, Kew, Surrey
Beards, Clifford, M.B.Oxfd. 1907, Pewsey, Wilts
Behan, Jeremiah, L.R.C.S.I. 1885, Lixnaw, Co. Kerry
Beley, George, M.R.C.S. 1899, Sheffield
Bellew, Thomas Mulholland, M.R.C.S. 1911, Alder Hey Hosp., Liverpool.
Benson, Percy Hugh, M.B.Aberd. 1873, Upper Walmer
Best, Albert James, L.R.C.S.Irel. 1912, Belfast
Bibby, William Ascroft, L.M.S.S.A. 1917, Liverpool
Biggs, John Maundy, M.R.C.S. 1878, Gosberton
Birkinshaw, Eileen Elizabeth (Mrs.), L.M.S.S.A. 1911, S. Croydon
Birks, Alan Herrenden, M.R.C.S. 1912, Belsize Park, N.W.
Black, Kenneth, F.R.C.S.Eng. 1904, Nottingham
Blackwood, John, L.S.A. 1895, Southsea
Bloomfield, Herbert Wadmore Gissing, M.R.C.S. 1895, St. Bart.'s Hospital
Body, Henry Marten, M.R.C.S. 1865, Wimborne
Bond, Charles Knox, M.R.C.S. 1884, Builth Wells
Borrow, Frederick Charles, M.B.Lond. 1901, Palmer's Green, N.
Braddon, William Leonard, M.R.C.S. 1884, Ealing
Brandon, Gordon Normanby, M.R.C.S. 1911, Ealing
Bronstorph, Ernest Ebenezer, L.R.C.S.Edin. 1918, Coburg Court Hotel
Brown, James Farquharson, L.S.A. 1891, Commercial Rd., E.
Buckley, John, L.S.A. 1898, Manchester
Burton, Charles Frank, M.C., M.R.C.S. 1913, Upper Norwood

Campain, Joseph Henry, M.R.C.S. 1911, Hull
Carr, Donald William, M.B.Camb. 1893, c/o C.M.S.
Cassidy, Joseph Lamont, M.D.Durh. 1877, Ramsgate
Chambers, John Miles, M.R.C.S. 1897, Murtle
Chambry, Johannes Karel Joseph, M.R.C.S. 1915, Wednesbury
Charlesworth, George, L.S.A. 1887, Plaistow, E.
Chatterton, Percy, L.S.A. 1866, Stockwell Green, S.W.
Chevreau, Paulin Roger, M.R.C.S. 1914, Redcliffe Sq., S.W.
Cieh, Ying-Jue, M.R.C.S. 1915, Chinese Legation
Clarke, James Fernandez Howard, L.S.A. 1884, Shaftesbury Ave., W.
Close, Edmund Napier, L.R.C.S.I. 1881, Exeter
Coates, Henry Honiton, M.R.C.S. 1890, Skerries
Coathupe, Edwin Wise, M.R.C.S. 1859, Oxford
Collyer, James Ralph, M.R.C.S. 1884, Playden
Coxwell, Charles Fillingham, M.D.Camb. 1891, Dulwich
Cropper, John Hardman, L.R.C.S.Ed. 1883, Bristol
Crossit, Richard, L.R.C.S.Ed. 1876, Cookstown
Cuthbertson, John Oswald, M.B.Oxfd. 1901, Droitwich

Dargan, Patrick Arthur, M.R.C.S. 1916, St. John's Wood
Davenport, Robert Cecil, M.R.C.S. 1916, Highgate Rd., N.W.
Davey, Ernest Llewellyn, M.R.C.S. 1896, Walmer
Dearden, Harold, M.R.C.S. 1911, Lowndes St., S.W.
De Kleyn, Geradus Hendricus, L.M.S.S.A. 1916, Hampstead
Derry, Bartholomew Gidley, M.R.C.S. 1917, Bodmin
Dos Santos, Manoel Pedro, L.M.S.S.A. 1914, Bayswater, W.
Douty, Robert Joel Cazelet, M.R.C.S. 1912, Eastbourne
Driscoll, Cornelius Louis, L.M.S.S.A. 1907, Buckingham
Duka, Albert Theophilus, M.R.C.S. 1892, Bournemouth.
Duncan, George Cuthbertson, L.S.A. 1877, Charing Cross Hotel
Dvorkovitz, Paul, M.R.C.S. 1914, North Kensington
Dyson, John Newton, M.R.C.S. 1901, Eastbourne

Eatock, Eric Richard, M.B.Manc. 1911, Crumpsall, Manchester
Ede, Alfred Gordon, M.B.Lond. 1900, E. Molesey
Edwards, Arthur Rea, M.R.C.S. 1881, Cirencester
Ellerton, John, M.D.St. And. 1862, Middlesborough-on-Tees
Ellis, Robert Sidney, M.B.Edin. 1900, Aston Cross, Birmingham
Elrington, Nicolas, M.R.C.S. 1893, Wethersfield
Embleton, Dennis, M.R.C.S. 1906, Hampstead

Emlyn, Charles Willmore, M.R.C.S. 1890, Colworth Hall

Fairchild, George Cranston, M.R.C.S. 1914, Bishops Stortford
Fendick, Robert George, M.R.C.S. 1867, Livermead, Torquay
Fiddian, James Victor, M.R.C.S. 1912, Brentford
Flaxman, Samuel Christopher Reeve, M.R.C.S. 1909, Peckham
Forrest, John George Stracey, M.R.C.S. 1876, Winchester
Foster, Edward Cecil, M.R.C.S. 1902, Oxford
Fuller, Ashbury Joseph Stuart, M.R.C.S. 1908, Aberystwyth

Gasperine, John Jones, M.R.C.S. 1916, Stockton-on-Tees
Gauntlett, Harry Leon, M.R.C.S. 1909, Bloxham
Ghose, Sores Chandra, L.M.S.S.A. 1915, Devonport
Ghosh, Abani Mohan, M.B.Ed. 1915, Brighton
Gillam, Thomas Henry, L.S.A. 1876, Tenbury
Gilruth, George Ritchie, L.R.C.S.Ed. 1865, Edinburgh
Girgis, Melik, L.M.S.S.A. 1918, Hampstead
Gott, Jeffrey, L.S.A. 1897, Ringwood
Gunning, Montague Shirley Wyatt, L.R.C.P. Ed. 1888, Hunter's Bar
Gupta, Panna Lal, M.B.St. And. 1915, c/o Thos. Cook and Son

Hale, Edmund Thomas, L.S.A. 1870, Chiswick
Hall, Ethel Margaret Eades, L.M.S.S.A. 1911, Lancaster
Hampson, Joseph, M.R.C.S. 1878, Atherton, Manchester
Hanworth, Honoria Josephine (Mrs.), M.R.C.S. 1915, Russell Sq., W.C.
Harding, Geoffrey Duncan, M.B.L'pool 1914, Claughton
Hardy, George Wilfrid, L.R.C.P. 1906, Sutton
Harrison, Percy Booth, M.R.C.S. 1906, Dalston
Harvey, Thomas Reginald, M.R.C.S. 1909, Avebury
Hawkins, Charles Thomas, M.R.C.S. 1908, Garnant
Heap, Edward Fortrey George Turnbull, M.R.C.S. 1901, St. Asaph
Hill, Richard Athelstane Parker, M.D.Camb. 1913, Harrow
Hocken, Herbert Castlemain, L.S.A. 1901, Barnsley
Hodgkinson, Isaiah, M.D.Durh. 1913, South Shields
Hodson, Ronald, M.C., M.R.C.S. 1912, Temple, E.C.
Hooper, Alfred, M.D.Durh. 1904, Gaddesby
Hope, Percy Lake, M.R.C.S. 1899, Hampton Wick
Houchin, Edwin Augustus, L.S.A. 1902, Cambridge Gardens, W.
Hughes, Sidney, M.R.C.S. 1897, Clapham
Hulbert, Henry Harper, M.R.C.S. 1883, Queen's Gardens, W.
Hull, Henry Woolcott, M.R.C.S. 1893, Southend-on-Sea

Ingle, Arnold Clarkson, M.D.Camb. 1892, Harpenden
Ingle, Laurence Manfield, M.R.C.S. 1914, Harpenden
Jackson, George Maudsley, M.R.C.S. 1915, Clifton
Jacobsen, George Oscar, M.R.C.S. 1882, Alford
James, Walter Evelyn, M.R.C.S. 1890, Derby

Jay, Frederick Fitzherbert, M.D.St. And. 1883, Constitutional Club, W.C.
Johnston, Lambert Arthur Wellesley, M.R.C.S. 1901, Edgbaston
Jones, Arthur Reginald, M.R.C.S. 1897, Leigh
Jones, Edward Shirley, M.R.C.S. 1897, Liverpool
Jones, Samuel Walter Maslen, M.R.C.S. 1914, Sandown, I.O.W.
Joynson, Gerald George, M.R.C.S. 1894, Southport
Judah, Nathanael Joseph, M.B.Ed. 1911, Ash Green

Kameneff, Vladimir, M.R.C.S. 1916, University College Hosp.
Kebbell, Charles Frederick Vivian, M.R.C.S. 1909, West Ealing
Keys, Robert Atchison, F.R.C.S.Ed. 1874, Wolverhampton
Khan, Haji Hyderali, L.M.S.Bombay 1914, Guy's Hospital
Kilgour, William Robert, M.R.C.S. 1906, Cromwell Rd., S.W.
Kingsford, Percival, L.S.A. 1869, Queensberry Place, S.W.
Knobel, William Bernard, M.D.Camb 1905, Belbroughton
Knowles, Cyril Reginald, M.C., M.B.Leeds 1916, Bridlington
Knyvett, Hugh Ferrars, L.R.C.P.Ed. 1889, Ridgemount Gardens, W.C.

Langley, John Inman, M.R.C.S. 1898, Coventry
Lazanas, Elias Panagis, M.R.C.S. 1916, Harley St., W.
Lea-Wilson, Basil Hugh Campbell, M.R.C.S. 1911, Gainsborough
Ledger, Lloyd Kirkwood, M.R.C.S. 1917, Hereford
Lemon, Edward Henry, M.R.C.S. 1889, Bournemouth
Lomax, Montague, M.R.C.S. 1883, Brighton
Low, Charles Arthur, L.S.A. 1877, St. Leonards-on-Sea
Lowe, Charles Edwin Maximilian, M.B.Vict.U. 1892, Crewe
Lynes, John, L.S.A. 1884, Kensington, W.

MacDonald, Charles Eric Wells, M.R.C.S. 1908, Ilford
McGlynn, James, L.R.C.S.Ed. 1898, Castlederg
McQueen, Robert Martin, M.R.C.S. 1903, Boundary Rd., N.W.
Manders, Horace, F.R.C.S.Eng. 1878, Harley St., W.
Master, Jehangir Ardeshir, L.M.S.Bombay 1905, Upper Holloway, N.
Matthews, George William, M.R.C.S. 1912, Maxwelltown
Maugham, William Somerset, M.R.C.S. 1897, Mount St., W.
Maunsell, Frederick Wyndham, M.R.C.S. 1916, c/o Nat. Mortgage and Agency Co. of New Zealand
May, Francis Hollingsworth, L.S.A. 1890, Birmingham
Menon, Puthiyaveettil Narayana, M.R.C.S. 1917, Royal Eye Hosp., Manchester
Mercer, William Bracewell, M.B.Camb. 1892, Southbourne
Meyer, Gustav, L.M.S.S.A. 1912, Rosebery Ave., E.C.
Mitchell, Arthur Oscar, M.R.C.S. 1910, Herne Hill
Mitchell, George Stanley, L.M.S.S.A. 1916, Herne Hill
Moore, Benjamin, M.R.C.S. 1907, Oxton
Morgan, Ethel Mary, M.B.Lond. 1910, Weymouth
Morrell, Reginald Arthur, M.R.C.S. 1909, Harley St., W.
Morris, Frederick Temple, M.R.C.S. 1892, Cardiff
Morrison, Harold, L.M.S.S.A. 1915, Ealing
Morton, Samuel, M.R.C.S. 1863, Sheffield
Moxey, Percy, L.S.A. 1906, Dorchester
Moxon, Alban Henry, M.R.C.S. 1886, Catford, S.E.
Moxon, Alfred, L.S.A. 1886, Kenilworth
Moxon, Herbert William, M.R.C.S. 1906, Matlock
Murray, William, M.D.Durh. 1862, Newcastle-on-Tyne

Nash, Charles Henry, L.R.C.P.Ed. 1903, Mortimer
Neil, William Fulton, M.R.C.S. 1908, Endsleigh Gardens, N.W.
Noel, Hubert Lewis Clifford, M.R.C.S. 1910, Chingford
Nolan, Bryan Joseph, L.M.S.S.A. 1910, Southgate
Norton, Algernon Charles Wodehouse, L.S.A. 1854, Chepstow Villas, W.
Nunn, James Henry Francis, M.R.C.S. 1896, Balham High Rd., S.W.

Oakes, Arthur, M.R.C.S. 1853, Birmingham
O'Brien, Russell James, M.B.Ed. 1879, Maida Hill, W.
O'Donovan, William James, M.R.C.S. 1909, Bow, E.
Oglesby, Henry Newsome, M.R.C.S. 1883, Perry Bar, Birmingham

Paley, Charles Edward Hewitt, M.R.C.S. 1910, Nottingham
Palmer, Ambrose Myrie, M.R.C.S. 1872, Chesterfield
Pank, Philip Esmond Durrell, M.R.C.S. 1916, Chandler's Ford
Pannett, Charles Aubrey, M.B.Lond. 1906, Church End, Finchley
Pantcheva, Elliot Jessie (Mrs.), M.B.Durh. 1911, Judd St., W.C.
Parker, George Fisher, L.S.A. 1860, Cuckfield
Perkins, Whitfield, M.D.Durh. 1886, Port Isaac
Perry, Walter Dymock, M.R.C.S. 1895, Earl's Court, S.W.
Pfeiffer, Albert, M.R.C.S. 1911, Wimpole St., W.
Pill, Stanley Victor Percy, M.R.C.S. 1915, Ladbroke Grove, W.
Place, Thomas Lloyd, M.R.C.S. 1865, Oxford Terrace, W.
Pocock, Theodore Charles, M.B.Lond. 1906, Hove
Polson, James Ronald, M.D.Birm. 1903, Highcliffe, Christchurch
Ponniah, Sengarapillia, L.R.C.P.Ed. 1914, c/o Surgeons' Hall
Poole, Kenneth Worsley, M.B.Durh. 1890, Addison Bridge, W.
Pooler, John Read, M.B.Birm. 1903, Westcliff-on-Sea
Potts, Matthew Bertram, M.B.Manc. 1906, West Vale
Price, William Matthews, M.R.C.S. 1896, Christchurch
Prince, Hugh Tennant, M.R.C.S. 1893, Boston Spa
Prior, Edward Thurlow, L.S.A. 1877, Loddon
Provis, Francis Lionel, M.R.C.S. 1898, Hanover Sq., W.

Race, Edmund, M.B.Durh. 1893, South Shields
Ramsbottom, Charles Henry Geoffrey, M.D.Vict.U. 1897, Whitchurch
Reed, Henry Albert, L.S.A. 1884, c/o O.S. Navigation Co.
Reeve, Edward Gordon, M.R.C.S. 1912, Queen's Gate, S.W.
Reid, Sydney Jessie Scott, M.R.C.S. 1913, Cheniston Gardens, W.
Rennie, William, M.R.C.S. 1889, King's Heath
Rice, Hubert Richard, L.S.A. 1897, c/o Bank of Adelaide
Roberts, Hugh Corrall, M.R.C.S. 1893, Melton Mowbray
Roberts, John Dungey, M.R.C.S. 1869, Ealing
Roberts, Joseph Harry, M.B.Ed. 1891, Hastings
Roberts, Richard Cadwaladr, M.R.C.S. 1906, Wymeswold
Robinson, Edmund, M.R.C.S. 1867, Leeds
Robinson, Norman Battye, M.R.C.S. 1888, Henley-on-Thames
Robinson, William Newman, M.D.Q.U.Irel. 1868, Ealing Common
Rogers, Henry Cripps, M.R.C.S. 1865, Lympstone
Rogerson, William Albert, M.R.C.S. 1914, Leyland, Preston
Rosenberg, Sophie Sarah, M.R.C.S. 1917, Queen Mary's Hosp. for the East End
Rowbotham, Edgar Joseph, M.R.C.S. 1894, Clapham Common
Royle, Elsie Marsh, M.D.Manc. 1909, Wigan
Ruel, Charles Percival, M.R.C.S. 1889, Southsea
Ruttledge, William Edward, M.R.C.S. 1900, R.A.M.C., Blackpool
Ryan, Thomas, L.S.A. 1882, Kilkenny

Scott, Ralph Robert, L.R.C.S.Irel. 1853, Bath
Seagrove, George Mervyn, L.S.A. 1906, Etchingham
Sear, John Taylor, M.R.C.S. 1896, Enfield
Seddon, Allan, M.B.L'pool 1911, c/o Cox and Co.
Seddon, Harold, M.B.L'pool 1912, Liverpool
Seon, Greville Ewing, M.R.C.S. 1882, Folkestone
Shaffi, Mian Mohammad, L.M.S.S.A. 1917, London Hospital, E.
Shah, Bager Zainulabiedin, M.R.C.S. 1914, Miller Hospital, S.E.
Sharpe, Claudius Galen Kaye, M.B.Leeds 1910, Luton
Shillingford, Henry Bartlett, L.S.A. 1890, Camberwell, S.E.
Shimberg, Mandell, M.R.C.S. 1917, London Hospital, E.
Simpson, George Barthorpe, L.R.C.P.Ed. 1897, Smethwick
Sloper, John Smith, M.R.C.S. 1913, Victoria Hosp. for Children, Chelsea
Snowdon, Alan Richmond, M.R.C.S. 1911, Scotswood
Somerset, Vere Edward, M.R.C.S. 1911, Finchley, N.
Sommer, Sarah Charlotte Eliza, M.B.Lond. 1905, Hoveringham
Southern, Francis Gerald, L.S.A. 1884, Llandebie
Speedy, Robert George Dunell, M.R.C.S. 1888, Bedford
Spencer, John Heatly, M.B.Lond. 1906, Lower Seymour St., W.
Spillane, James Charles, M.B.Lond. 1895, Royal Societies Club
Stanley, Charles James, M.R.C.S. 1888, Ealing.
Statter, Henry Bellamy, M.R.C.S. 1890, Bournemouth
Steel, Henry Golege, L.M.S.S.A. 1912, Southampton
Stewart, Hugh George, M.D.Glasg. 1901, Normanton
Stolterfoth Charles Sigismund, M.R.C.S. 1903, Wallingford
Sutcliffe, Alan Lee, M.B.Camb. 1914, Burley-in-Wharfedale
Swindale, Henry Vernon, L.S.A. 1900, Southwick Place, W.

Tetley, Frederick Harrison, L.R.C.S.Ed. 1877, Rugby
Thirkill, Henry, L.S.A. 1885, Leeds
Thompson, George Hobson, M.R.C.S. 1888, Buxton
Thompson, Maitland, M.R.C.S. 1884, Hemel Hempstead
Thomson, Arthur Peregrine, M.B.Birm. 1915, Northfield
Thorburn, Ian Campbell, L.S.A. 1905, Birkenhead
Thorpe, George Elisha Knight, L.S.A. 1869, Sheffield
Titterton, Herbert Charles, M.R.C.S. 1902, Hampden Club, N.W.
Todd, John, M.R.C.S. 1865, Mile End Rd., E.
Todd, William Fentham, M.R.C.S. 1907, New Malden
Toulmin, Ernest William, M.R.C.S. 1908, St. John's Wood
Tripp, Basil Hubert Howard, M.R.C.S. 1909, Southwold
Tucker, Sydney Arthur, M.B.Lond. 1909, Bromley

Wade, Albert Holland, L.S.A. 1900, St. John's Wood, N.W.
Waldron, Charles Edward, M.R.C.S. 1907, London Hospital, E.
Walker, Ernest Ronald, M.R.C.S. 1901, Bromley
Walker, George, M.R.C.S. 1889, Forest Hill, S.E.
Walker, James, M.R.C.S. 1867, Hull
Walker, Lewis Augustus, M.R.C.S. 1899, Lee-on-the-Solent
Wallace, Gerald Douglas Hamilton, M.R.C.S. 1907, Newtown
Waltenburg, Theophilus Ralph, L.S.A. 1904, Manchester
Walter, Ernest William, M.R.C.S. 1878, Stockwell, S.W.
Waltere, Enid Margaret, M.B.Lond. 1908, Broadstone, Dorset
Warburton, John Rollo Noel, M.R.C.S. 1914, West Dulwich
Warburton, Joseph Wilkinson, M.R.C.S. 1864, Bournemouth
Ward, Frederic Henry, M.R.C.S. 1865, Ealing
Warden, Horace Frederick William, M.R.C.S. 1913, Lexham Gardens, W.
Watson, John Wallace, M.S.R.U.Irel. 1887, Ivanhoe Hotel, W.C.
Webb, Frank, M.R.C.S. 1890, Leigh
Weizmann, Vera Rebecca (Mrs.), M.B.Manc. 1912, Rusholme, Manchester
West, Richard Milbourne, M.R.C.S. 1891, Leicester
White, John Bradshaw, M.D.Q.U.Irel. 1869, Upper Clapton, N.E.
Wilkin, Loftus Ralph, M.R.C.S. 1882, York
Wilkinson, Lancelot Craven, M.R.C.S. 1914, St. Bart.'s Hospital
Williamson, William Pettigrew, L.S.A. 1899, Royal London Ophthalmic Hospital
Wilson, Charles William, M.R.C.S. 1874, Bury St. Edmunds
Wilson, Mervyn Seppings, L.S.A. 1882, Chippenham
Wilson, William Bernard, M.R.C.S. 1915, Hackney, E.
Wilton, Stanley, M.D.Oxfd. 1903, East Liss
Winter, Frank, M.B.Durh. 1886, Newcastle-on-Tyne
Wolfenden, Richard Norris, M.D.Camb. 1884, Sidcup
Wood, John Askey, M.R.C.S. 1890, Northampton
Woods, Charles Murray, L.S.A. 1902, Charleville Rd., W.
Woolham, Josiah Gilbert, M.B.Vict.U. 1901, Manchester
Wylie, James Thompson Roy, M.R.C.S. 1892, Sallins

Young, Campbell, M.R.C.S. 1916, West Worthing
Young, Roy Frew, M.B.Camb. 1909, Glasgow

Zarchi, Smerka, L.M.S.S.A. 1913, Russian Law Bureau

(b) PRACTITIONERS REGISTERED ON THE COLONIAL LIST.

Abbott, Nigel Basil Gresley, M.B.Adelaide 1916, Cheltenham Gen. Hosp.

Bharucha, Kaikhusru Byramji, L.M.S.Bombay 1914, Brighton
Bharucha, Nadir Nasserwanji, L.M.S.Bombay 1909, Earl's Court, S.W.
Bird, Mary Adelaide (Mrs.), M.D.McGill 1915, Gerrard's Cross
Birrell, William Alexander Hamilton, M.B. Melb. 1915, c/o Bank of Victoria, E.C.
Biswas, Lalit Mohon, L.M.S. Calcutta 1911, c/o Thos. Cook and Son
Black, Geoffrey Howard, M.B.Adelaide 1916, Birmingham
Blair, Archibald Turner Macleod, M.B.N. Zealand 1906, Hammersmith Infirmary, W.
Blashki, Eric Phillip, M.C., M.B.Sydney 1915, c/o Bank of Australasia, E.C.
Bretherton, Albert Wilber, M.B.Melb. 1915, Bristol
Brown, Chester Pettit, M.B.Toronto 1913, No. 4 Canadian Gen. Hosp.
Brownbridge, Thomas Roy, M.D.Man. 1916, c/o Army Post Office

Casserley, Michael Joseph, M.B.Toronto 1908, c/o Messrs. Holt and Co.
Chaliha, Lakshmi Prasad, L.M.S.Calcutta 1895, c/o Thos. Cook and Son
Chand, Amir, M.B.Punjab 1913, c/o Messrs. H. S. King and Co.
Chohan, Noormahomed Kasembhoy, L.M.S. Bombay 1913, Cromwell Rd., S.W.
Costain, William Alfred, M.B.Toronto 1911, Lancaster Gate, W.

Das, Premananda, L.M.S.Calcutta 1899, Edinburgh

Elliott, Byron Stevenson, M.D.Toronto 1907, Witley Camp
English, Robert Joseph, M.B.Sydney 1909, c/o Bank of N.S. Wales

Fleming, Thomas Gordon, M.C., M.B.Adelaide 1909, Torrington Square, W.C.
Fraser, Alexander Clow, M.B.Melb. 1915, Fovant, Wilts.

George, Thomas Edwin, M.B.Melb. 1912, c/o N. Bank of Australasia

Ghosh, Kiranendu, L.M.S.Calcutta 1912, c/o Thos. Cook and Son
Godby, William Heitland, M.B.Melb. 1914, South Hampstead, N.W.
Griffiths, Ada Isabella Valentine, M.B.Melb. 1905, Evelina Hospital, S.E.
Guest, Edna Mary, M.B.Toronto 1910, Piccadilly, W.

Hamilton, George Harold Ross, M.B.Toronto 1910, Swansea
Hartridge, Oliver Keith, M.B.Melb. 1912, c/o Bank of N.S. Wales
Hassan, Syed, L.M.S.Punjab 1900, c/o H. S. King and Co.
Hawthorne, William Stuart, M.B.Sydney 1915, c/o Holt and Co.
Hewitt, Samuel Ross De Lapp, M.B.Toronto 1914, Woodcote Park, Epsom
Hodgson, Ronald George Keith, M.B.N. Zealand 1915, c/o Bank of N.S. Wales
Howlett, George Patrick, M.C.P. and S. Ont. 1909, Woodcote Park, Epsom

Jeffries, Lewis Wibner, O.B.E., M.B.Adelaide 1907, Hackney Rd., N.E.
Joyce, Cecil Roy, M.D.McGill. 1914, Queensborough Terrace, W.

Kamdin, Rustom Dossabhoy, L.M.S.Bombay 1912, c/o Thos. Cook and Son
Karaka, Dhanjishaw Phirozshaw, L.M.S. Bombay. 1912, Kingswood, Bristol
Kinsella, Malcolm Daniel Boyd, M.D.Ont. 1912, Prince of Wales Hosp., N.
Kneebone, John Le Messurier, M.B.Adelaide 1911, Torrington Square, W.C.

Laskari, Phiroz Framji, M.B.Bombay. 1914, Brighton
Lawyer, Annie Amanda, M.D.Ont. 1888, Dawlish
Leacy, Patrick, M.B.Ont. 1916, Witley Camp
Leith, George, M.D.Man. 1917, Witley Camp
Longley, Israel Fletcher, M.C.P. and S.Sask. 1911, Northampton

McCaffrey, Ernest Moore, M.B.Sydney 1916, Swansea
McDonald, Sydney Fancourt, M.D.Melb. 1913, c/o Bank of Victoria

Messenger-Pearson, Stella May (Mrs.), M.D. Dalhousie. 1904, Russell Square, W.C.
Monahan, Richard Joseph, L.M.S.N. Scotia, P.M. Bd. 1907, Torrington Square, W.C.

O'Leary, Ralph Daniel, M.B.Melb. 1906, Chatham
Oonvala, Jehangir Hormusji, L.M.S.Bombay 1910, c/o Thos. Cook and Son

Palmer, John Ernest, L.M.S.N.B. Co. 1915, c/o Bank of Montreal
Pettit, Thomas Harold, M.B.N. Zealand 1913, c/o Bank of N. Zealand
Poduval, Ambadi Rama, M.B.Madras 1912, Birkenhead
Purves, Allan Melrose, M.C., M.B.Sydney 1909, Golder's Green

Rau, B. Kesava Narayana, M.B.Madras 1910, Oxford
Robertson, Herbert Donald, M.B.N.Zealand 1911, Gordon Sq., W.C.
Rutter, John Hemphill, M.B.Melb. 1907, c/o Union Bank of Australia

Sabnis, Ramchandra Dattatraya, M.D.Bombay 1915, Hampstead, N.W.
Shaw, Thorne William, M.D.Man. 1917, Bellshill
Short, Hugh, M.B.N.Zealand 1914, Brompton Hosp., S.W.
Sleeman, James Garnet, M.B.Melb. 1915, c/o Bank of Victoria

Talati, Jehangir Manekji, M.B.Bombay 1913, Brighton
Thompson, Leslie Joseph, M.B.N.Zealand 1912, Edinburgh
Thompson, William Barbour, M.B.Sydney 1913, Lewisham

Vaidya, Jagannath Balkrishna, L.M.S.Bombay 1910, c/o Thos. Cook and Son

White, James Renfrew, M.B.N.Zealand 1912, c/o Bank of N. Zealand
Woodhouse, Philip Randal, D.S.O., M.B. N. Zealand 1910, W. Kensington, W.

(c) PRACTITIONERS REGISTERED ON THE FOREIGN LIST.

Bertrand, Paul Aime Albert Alex, M.D. Brussels 1900, Connaught Rd., E.

Compeeren, Emile Felix, M.D.Louvain 1884, Wallington
Curioni, Fernando, M.D.Turin 1901, Shaftesbury Ave., W.

De Bie, Joseph, M.D.Louvain 1887, Liverpool
de France, Maurice, M.D.Ghent 1908, Coventry
de Francisco, Donato, M.D.Bologna 1898, Torrington Sq., W.C.
Delbastee, Georges, M.D.Brussels 1887, Hampstead, N.W.
De Naeyer, Theodore, M.D.Louvain 1886 Brixton Hill, S.W.
de Neeff, Cesar Victor Emmanuel, M.D. Brussels 1902, Reading
Druart, Camille Nicolas, M.D.Brussels 1902, c/o Cunard S.S. Company

Green, Frederick, M.D.Naples 1906, Tottenham Court Rd., W.
Grijspeerdt, Simon Benoit, M.D.Ghent 1884, Forest Gate, E.

Haulet, Leon, M.D.Liége 1898, Glasgow
Hermant, Ernest, M.D.Brussels 1901, King Albert's Hosp., N.
Hottlet, Alfred, M.D.Louvain 1886, Leigh

Kemel, Richard, M.D.Louvain 1902, Liverpool
Kennis, Theodore, M.D.Louvain 1881, Westmorland St., W.
Kesteloot, Michel, M.D.Ghent 1905, Hadley Woods

Lauwens, Rene Marie Louis Ghislain, M.D. Louvain 1905, Sch. of Tropical Medicine, E.
Lemaire, Paul Albert, M.D.Liége 1906, Folkestone
Loonus, Hector, M.D.Louvain 1894, Brixton Hill, S.W.

Maertens, Louis Joseph, M.D.Louvain 1880, Maidstone
Mans, George, M.D.Brussels 1906, Woburn Place, W.C
Merchie, Edmond, M.D.Louvain 1900, Brixton Hill, S.W.
Mersch, Edmond, M.D.Brussels 1889, Woolwich, S.E.
Moreaux, Edouard, M.D.Brussels 1894, Croydon
Murdoch, John, M.D.Brussels 1911, Guilford St., W.C.
Muyshondt, Henri, M.B.E., M.D. Brussels 1899, Birtley

Pattyn, Pierre Antoine Camille, M.D. Louvain 1888, Farningham

Renoirdie, Henri, M.D.Brussels 1902, Bristol

Sambon, Louis, M.D.Naples 1891, Shoot-up-Hill, N.W.
Schmit, Roger, M.D.Louvain 1905, Warwick St., S.W.
Seeuwen, Henri, M.D.Ghent 1888, Manchester
Snocks, Maurice Edouard Remi, M.D.Ghent 1910, Sidcup

Thielmans, August, M.D.Louvain 1900, Talgarth

Van de Male, George, M.D.Ghent 1894, Streatham
Van den Wyngaert, Francis, M.D.Louvain 1895, Halifax
Van der Beken, Pierre Mathieu, M.D.Louvain 1906, Mansfield
Van der Voordt, Alfred, M.D.Brussels 1898, King Albert's Hosp., N.
Van Driessche, Albert, M.D.Louvain 1910, Manchester
Van Heteren, Clemens, M.D.Louvain 1892, Teignmouth
Van Hyfte, Henri, M.D.Brussels 1905, Birmingham
Van Mossenck, Auguste, M.D.Louvain 1898, Manchester
Van Raemdonck, Joseph Leonard, M.D. Louvain 1900, Walmersley, Bury
Verschoure, Polydore, M.D.Louvain 1880, Argyle Square, W.C.

Wigny, Charles, M.D.Liége 1897, Upper Bedford Place, W.C.
Wulffaert, Franz, M.D.Brussels 1912, Liverpool

PART II.

PRACTITIONERS ORIGINALLY REGISTERED IN SCOTLAND.

(Communications in regard to List II should be sent to the Registrar of the Scottish Branch Council, 20, Queen Street, Edinburgh.)

Adami, John, Scottish Triple 1917, Sunderland
Aitken, John Stevenson, Scottish Conjoint 1882, Wakefield
Angus, William Stephen, M.B.Aberd. 1908, Arbroath
Annequin, Edgar, Scottish Triple 1916, Glasgow
Armstrong, Janet, M.B.Edin. 1910, Swansea
Arnold, John Irwin, Scottish Triple 1912, Ennniscorthy

Baird, John Bruce, M.C., M.B.Glasg. 1910, Glasgow
Baldwin, Godfrey William Waller de Courcy, Scottish Triple 1889, Liverpool
Barseghian, (Basil) Mesroob, M.B.Edin. 1914, Manchester
Bell, George, M.B.Edin. 1892, Belfast
Bhattacharjee, Monindra Nath, M.B.Glasg. 1917, Glasgow
Bidie, Evan, Scottish Triple 1902, Braemar
Birnie, Charlotte Murdoch, M.B.Edin. 1911, York
Bowie, Thomas Chalmers, M.B.Edin. 1915, Edinburgh
Braid, Elizabeth Grace (Mrs.), M.B.Aberd. 1915, Keighley
Breen, Michael, Scottish Triple 1895, Birmingham
Brodziak, Edward Lewis Gordon, M.B.Edin. 1914, London
Bronstorph, Ernest Ebenezer, Scottish Triple 1918, Edinburgh
Brown, Arthur Campbell, M.B St. And. 1909, Teignmouth
Brown, Duncan Francis, M.B.Glasg. 1893, Greenock
Brown, Francis Frederick, M.B.Aberd. 1913, London
Buckley, Lucy, Scottish Triple 1898, Oldham

Budler, Arthur Harold de Wet, M.B.Edin. 1916, Edinburgh
Burge, Arthur Macafee, Scottish Triple 1915, Edinburgh

Cameron, James Thomson, M.B.Aberd. 1913, Aberdeen
Cameron, Robert Evan, M.B.Edin. 1914, Edinburgh
Canekeratne, Walter Edmond, M.B.Edin. 1917, Edinburgh
Carroll, Patrick, Scottish Triple. 1902, Manchester
Carwithen, Goldna Maude (Mrs.), M.B.Edin. 1091, Standeford
Case, Henry William, M.B.Edin. 1893, Manchester
Chambers, Henry Francis Townshend, Scottish Triple. 1889, Surbiton
Chandler, Frederick Charles, M.C., M.B. Edin. 1914, Edinburgh
Chatterjee, Haripado, Scottish Triple 1910, Whalsay
Christie, Allan Leslie, M.B.Edin. 1912, Edinburgh
Clarke, Allan Wise, Scottish Triple 1687, Liverpool
Clayton, William Arthur, Scottish Triple 1898, Preston
Collett, Edith Grace, Scottish Triple 1892, Sidmouth
Colvins, Henry Frank, Scottish Triple 1907, Edinburgh
Combe, Frederick Orloff, M.D.Edin. 1889, Bexhill-on-Sea
Conley, Wallace MacCallum, M.B.Glasg. 1913, Glasgow
Cook, Oswald, M.B.Edin. 1912, Birmingham
Cooke, Agnes Elizabeth Mary, M.B.Glasg. 1914, Greenock
Cosgrove, Charles, Scottish Triple 1913, Edinburgh
Coutts, Edgar Nesbitt, Scottish Triple 1904, London
Cowe, John, Scottish Triple 1889, Liverpool
Craik, William, M.B.Glasg. 1892, Goldthorpe
Cumming, Robert Scott, M.C., M.B.Aberd. 1915, Aberdeen

Dakers, Bernard William, Scottish Triple 1906, Brigg
Dalal, Muljibhai Kuberdas, Scottish Triple 1914, Sheffield
Davies, George Augustus, M.D.Edin. 1905, Musselburgh
Davies, Philip Lys, M.B.Edin. 1912, Chislehurst
Davies-Jones, Charles William Sanderson, M.B.Edin. 1915, Edinburgh
Davis, Bernard Langridge, O.B.E., M.B. Aberd. 1915, Aberdeen
Devane, Thomas Francis, Scottish Triple 1892, Oakengates
Diack, Patrick William, M.B.Aberd. 1891, London
Dickson, Edward Demetrius Dalziel, M.B. Edin. 1918, Edinburgh
Dickson, James, M.C., M.B.Edin. 1916, Edinburgh
Doran, Winnifrid Mary, Scottish Triple 1913, Belfast
Dorset, Richard, Scottish Triple 1914, Edinburgh
Drummond, Russell John, M.D.Edin. 1894, Edinburgh
Drynan, Alexander Erskine, M.C., M.B.Edin. 1911, Edinburgh

Elliott, John, Scottish Triple 1897, Beal
Enright, Maurice Hickey, Scottish Triple 1896, Wigan
Esterman, Tobias, M.B.St.And. 1915, Dundee
Evans, Thomas Henry, Scottish Triple 1897, Liverpool
Ewart, Edward, M.D.Edin. 1902, Gullane
Ewart, John Hoggan, M.D.Edin. 1897, Hythe

Fearnside, Clarence Forbes, M.B.Aberd. 1889, Conway
Ferguson, John Potterton, Scottish Triple 1888, Dunedin
Findlay, Harry Taylor, M.B.Glasg. 1915, Glasgow
Fleming, James Hamilton, Scottish Triple 1899, Paisley
Fletcher, Duncan, Scottish Triple 1895, Portree
Forsyth, William, Scottish Conjoint 1875, Abingdon

Gadgil, Bhaskar Balwantrao, M.B.Edin. 1916, Edinburgh
Garewal, Ajab Singh, M.B.Edin. 1917, Edinburgh
Geale, William James, Scottish Triple 1906, Edinburgh
Gemmill, William, M.B.Glasg. 1901, West Bridgford
Giblin, Arthur Leslie, Scottish Triple 1916, Edinburgh
Gillespie, John Marchbank, M.C., M.B.Edin. 1911, Swansea
Girvan, Alexander, M.D.Glasg. 1904, London
Glaister, Joseph, M.B.Glasg. 1905, London
Goldberg, Harry Raephal, M.B.Edin. 1918, Haddington
Gordon, William Gordon, M.B.Aberd. 1905, Malvern
Granger, Robert Fawcitt, Scottish Triple 1889, Liverpool
Grant, George Reginald, M.C., M.B.Edin. 1913, Edinburgh
Gray, David George, M.B.Edin. 1907, Belfast
Gray, Francis Audubon, Scottish Triple 1902, Armagh
Griffiths, Alfred Thomas, Scottish Triple 1897, Cleckheaton
Gwynne, Joseph Robert, Scottish Triple 1913, Liverpool

Harley, Richard James, Scottish Triple 1903, London
Harmar, Mary, Scottish Triple 1895, London
Hawthorne, Walter Llewellyn, Scottish Triple 1893, Lucan
Hay, Jane Elizabeth, M.B.Edin. 1916, Dumfries
Haynes, Harold Cranwell Aloysius, M.C., Scottish Triple 1916, Edinburgh
Henderson, Janet Fraser, M.B.Glasg. 1915, Glasgow
Henderson, John Dunlop, M.B.Aberd. 1904, Aberdeen
Henderson, Norman Keane, M.B.Edin. 1916, Southport
Hennessy, Joseph Martin Reeves, Scottish Triple 1912, London
Henry, David Colvin, M.D.Edin. 1910, Great Yarmouth
Hetherington, George Mundell, M.B.Glasg. 1916, Tillicoultry
Heyliger, Ernest Denny Scott, M.B.Glasg. 1892, Blackburn
Hickey, Daniel John, Scottish Triple 1911, Blaengarw
Hill, James Rowland, M.B.Edin. 1907, Coleraine
Hope, Charles Milburn, M.B.Glasg. 1900, Market Drayton
Hopkins, William Edward, Scottish Triple 1909, Carnarvon
Huie, Henry Greville, M.D.Edin. 1893, Droxford
Hunter, John Arnold, M.B.Edin. 1896, Whitehead
Hunter, John Henry Graham, M.B.Edin. 1913, Edinburgh
Hutchison, Alice Marion, M.D.Edin. 1905, Edinburgh
Hyam, Samuel Priestly, M.B.Edin. 1894, Edinburgh

Jackson, George Fortesque, Scottish Triple 1894, Sutton Coldfield
James, Arthur Edwin, Scottish Triple 1914, Edinburgh
Jeffcoat, Leslie Fraser Eiloart, M.B.Edin. 1914, London
Johnson, Frank Davidson, Scottish Triple 1914, Edinburgh

Kaushosh, Ramchander, Scottish Triple 1913, Liverpool
Keiller, Alexander John, Scottish Triple 1889, New Pitsligo
Kerr, Felix Arthur, M.B.Glasg. 1912, North Shields
Kideton, Noel Wallace, M.B.Edin. 1906, Liverpool

Lamberton, James, M.B.Edin. 1912, Sheffield
Langley, William Johnson, Scottish Triple 1892, Basingstoke
Lee, James, M.D.Edin. 1902, Belfast
Lee, Ying Chuen, M.B.Edin. 1917, Edinburgh
Levy, Louis, M.B.Edin. 1914, Edinburgh
Lincoln, Hugh Percival Witwell, Scottish Triple 1894, Manchester
Lloyd-Jones, John Richard, Scottish Triple 1890, Nundle, N.S.W.

McCune, Lancelot Gordon, M.B.Edin. 1907, Belfast
Macdonald, Angus, M.D.Edin. 1912, Plymouth
Macdonald, Frank Bedingfeld, M.B.Edin. 1895, Northampton
Macdonald, Philip Norman Mackay, M.D. Edin. 1904, Tiverton
Macdonald, William, M.B.Edin. 1912, Edinburgh
McGregor, John, M.B.Glasg. 1873, Ardgay
Mackenzie, Hugh Munro Macleod, Scottish Triple 1894, Clevedon
Mackie, George, D.S.O., M.B.Edin. 1899, Malvern
Mackillop, Margaret Helen, M.B.Glasg. 1913, Glasgow
McKinnon, Neil Charles, L.R.C.S.Edin 1885, Sonya, Canada
Macknight, William Crawfurd, M.B.Edin. 1892, Liverpool
Macleod, Herbert William George, M.D. Edin. 1895, London
McNeill, Katharine Beatson Arbuckle (Mrs.), M.B.Edin. 1908, Llanelly
Macphail, Norman, M.B.Aberd. 1912, Ballindalloch
Macrae, Farquhar, M.B.Aberd. 1887, London
McRobbie, Alexander, M.B.Aberd. 1904, Banchory
McWillie, John George, M.B.Aberd. 1896, Hull
Malone, Reginald Hampstead, Scottish Triple 1918, London
Marshall, Thomas, Scottish Triple. 1891, Liverpool
Martin, John, Scottish Triple. 1914, Glasgow
Martyn-Clark, Robert Eric Noel, Scottish Triple 1913, Edinburgh
Mason, George William, Scottish Triple 1912, Pontypool
Mason, Margaret Baillie (Mrs.), M.B.Glasg. 1907, Glasgow
Matheson, Farquhar William, M.B.Edin. 1883, Cwmtwrch
Maunsell, Daniel Beresford, M.B.Edin. 1910, Edinburgh
Mavor, George Alexander, M.B. Aberd. 1892, Hounslow
Maynard, Frederick Arthur, M.B.Edin. 1890, Trealaw
Meek, Ronald, M.B.Glasg. 1912, Glasgow
Melrose, Thomas Robert Gray, Scottish Triple 1912, Edinburgh
Metcalfe, Thomas Marshall, Scottish Triple 1916, Glasgow
Miller, John Albert Henry, Scottish Triple 1907, Musselburgh
Milne, John Brownlee, M.B.Edin. 1900, Montrose
Mitchell, Andrew Ronald, M.D.Glasg. 1911, Glasgow
Mitchell, Mary Cochrane, M.B.Glasg 1909, Milton of Campsie
Mondon, Vilcourt Pierre, M.B.Edin. 1910, Blaina
Monro, David Carmichael, M.B.Edin. 1911, Edinburgh
Moore, Francis Laird, M.B.Edin. 1910, Bideford
Morrow, Hans Lowry, M.B.Edin. 1909, Enfield
Moxon, Benjamin Howard, L.R.C.P.Edin. 1871, Hull
Munro, Donald George Macleod, M.D.Edin. 1902, Maidenhead
Munro, Janey Lamond, M.B.Glasg. 1916, Glasgow
Murchie, Findlay, M.B.Glasg. 1909, Glasgow
Murray, William Henry, M.B.Glasg. 1888, London
Muterer, James George, M.B.Aberd. 1908, Aberdeen

Nevett, Alfred Jebb, Scottish Triple 1894, Stockport
Nicholson, Balfour Stewart, M.B.Glasg. 1893, Derby
Nicolson, Samuel, Scottish Triple 1896, Glasgow
Noble, Alexander, M.B.Aberd. 1906, Laurencekirk

O'Neal, Charles Duncan, M.B.Edin. 1904, Fulwell

Pallett, William Horner, M.B.Edin. 1914, Edinburgh
Palmer, Percy Gerald, M.B.Edin. 1908, Edinburgh
Patterson, William John, M.B.Edin. 1904, Worthing
Paul, David Hutcheon, M.D.Edin. 1909, Manchester
Paxton, Arthur Geoghegan, M.B.Glasg. 1905, Glasgow
Petroza, John William, Scottish Conjoint 1883, London
Penfold, William James, M.B.Edin. 1896, London
Platt, Garfield Arthur, Scottish Triple 1913, Edinburgh
Power, Francis Grene, Scottish Triple 1912, Edinburgh
Prentice, Adam, M.B.Edin. 1916, Edinburgh
Proctor, George Bridgeford, Scottish Triple 1889, Walton-on-Thames

Raffan, George, M.D.Edin. 1913, London
Ramsay, Maxwell, M.B.Edin. 1911, Edinburgh
Randell, Henry St. John, M.B.Edin. 1901, Aldershot
Reed, Kathleen, Scottish Triple 1909, Dublin
Rees, John Edward, Scottish Triple 1913, Gwaun Cae Gurwen
Reid, James, M.B.Aberd. 1904, Dublin
Reid, Spence Daer, M.B.Edin. 1911, Edinburgh
Richards, Arthur James, Scottish Triple 1893, Liverpool
Ritchie, Duncan, Scottish Triple 1897, Dundee
Ritchie, Frederick, M.B.Aberd. 1913, Aberdeen
Roberts, Charles Howard, Scottish Triple 1893, Devonport
Robertson, George Henry Whiteside, M.D. Edin. 1913, Westcliff-on-Sea

Robertson, Margaret Eason, M.B.Glasg. 1909, Glasgow
Robertson, Stuart Dewar, M.B.Glasg. 1914, Glasgow
Rose, John Alexander, M.B.Aberd. 1897, Salop
Russell-Cargill, James Alexander, M.B.Edin. 1908, London
Ryle, Arthur John, M.B.Edin. 1900, Colwyn Bay

Sardesai, Dinkar Sakharam, Scottish Triple 1909, Edinburgh
Saunders, Benjamin Theodore, M.B.Aberd. 1913, Aberdeen
Saville, William Henry, Scottish Triple 1887, Manchester
Scales, Cuthbert, M.C., M.B.Edin. 1913, Bradford
Scott, Archibald Alastair Bruce, M.B.St. And. 1916, St. Andrews
Scott, Hon. George Hepburne, M.B.Camb. 1898, London
Scott, James McAlpine, M.D.Glasg. 1913, Congleton
Sells, Hugh Lancelot, M.B.Edin. 1906, Edinburgh
Shiels, Peter McLaren, M.B.Edin. 1913, Edinburgh
Sinclair, Agnes Brymner, M.B.Glasg. 1900, Greenock
Sinclair, James Edward, Scottish Conjoint 1883, Aldeburgh
Sleigh, George Baird, M.B.Aberd. 1903, Broughty Ferry
Smith, Clifford Halliday Kerr, M.C., M.B. Edin. 1914, Humbie
Smith, Edwin Charles Allan, Scottish Triple 1911, Perth
Smith, George McCall, M.B.Edin. 1904, Perth
Smith, John Kenneth, M.B.Glasg. 1914, Glasgow
Smithies, Walter, M.B.Edin. 1912, Atherstone
Standring-Smith, Robert Charles, M.B.Edin. 1905, Ipswich
Stephens, Riccardo, M.B.Edin. 1893, Brora
Steuart, Roger St. Clair, M.D.Edin. 1908, Edinburgh
Stewart, Arthur Ford, M.B.Glasg. 1909, Glasgow
Stewart, Henry, M.B.Glasg. 1914, Glasgow
Stewart, James David Grahame, M.B.Edin. 1910, Edinburgh
Stewart, William Ross, M.B.Edin. 1912, Edinburgh
Strachan, Benjamin, M.B.Glasg. 1877, Cotherstone
Strong, Clement Percival, M.B.Edin. 1900, Woking
Sullivan, Patrick, Scottish Triple 1895, London
Swaffield, Walter Henry, M.D.Edin. 1903, London
Swan, James Douglas Carnon, M.B.Glasg. 1899, Glasgow
Symons, Thomas George Gordon, Scottish Triple 1892, Southsea

Tait, John, Scottish Triple 1893, Alyth
Taylor, Robert Scott, M.B.Glasg. 1907, Johnstone
Telford, Robert Whitson, M.D.Edin. 1909, Edinburgh
Thomas, Adolphe Harrison, M.B.Edin. 1881, Thornton Heath
Thomas, William James, M.D.Edin. 1889, Sutton
Thomson, Henry James, M.B.Aberd. 1910, Alford
Thomson, Peter, M.B.Glasg. 1893, Glasgow
Tibbles, Joseph Russell, M.B.Aberd. 1915, Melton Mowbray
Turnbull, Arthur, M.B.Glasg. 1909, Glasgow

Valentine, Gilbert Enos, M.B.Aberd. 1914, Montrose
Vickerman, Philip Seston, O.B.E., M.B.Edin. 1905, London

Walker, William, M.C., M.B.Aberd. 1914, Newcastle-on-Tyne
Walker, William James Alexander, M.B. Glasg. 1897, Glasgow
Wallace, Robert, M.B.Edin. 1918, Edinburgh
Wang, Chung Ching, M.D.Edin. 1916, Edinburgh
Ware, Samuel Middleton, Scottish Triple 1908, Edinburgh
Warwick, Hugh Fleming, M.C., M.B.Glasg. 1904, Milliom
Watson, Frederick Robert, Scottish Triple 1909, Edinburgh
Wedgwood, Percy Ashworth, Scottish Triple 1898, York
White, John Duncan, M.B.Edin. 1917, Edinburgh
White, Rosina Jane, Scottish Triple 1898, Leith
Whittingham, Harold Edward, M.B.Glasg. 1910, Glasgow
Wilkinson, Ada, M.B.Edin. 1902, Birmingham
Wilkinson, Albert Robinson, Scottish Triple 1896, Worthing
Wilkinson, Stephen Harold, M.B.Edin. 1910, Woodhall Spa
Willcox, Frank Mayes, M.B.Edin. 1896, Edinburgh
Wilson, Alexander Fraser, M.C., M.B.Edin. 1889, London
Wilson, Donald McDonald, M.C., M.B.Edin. 1911, Greenock
Wilson, Henry, M.B.Glasg. 1881, Dunblane
Wilson, Robert Murray McCheyne, Scottish Triple 1911, Edinburgh
Wright, Bertram Ernest, M.B.Edin. 1914, Edinburgh
Wright, Reginald Harcourt, Scottish Triple 1893, Manchester

Young, Andrew Morton, M.B.Glasg. 1913, Glasgow
Young, George, M.B.Glasg. 1905, Liscard, Cheshire
Young, Robert Henry, M.B.Glasg. 1883, Southend-on-Sea

PART III.

PRACTITIONERS ORIGINALLY REGISTERED IN IRELAND.

(Communications in regard to List III should be sent to the Registrar of the Irish Branch Council, 35, Dawson Street, Dublin.)

Ainley, John Francis, M.B.Q.U.Belf. 1917, Belfast

Beasley, Henry Cecil, Irish Conjoint 1893, Selby
Beatty, James, M.B.Univ. Dubl. 1895, Northampton
Beatty, Thomas Edward Bellingham, L.M. Univ. Dubl. 1915, Monkstown
Bonis, Francis William, M.D.Univ. Dubl. 1898, Mullingar
Bourns, Charles, Irish Conjoint 1870, Oxted
Byrne, Daniel Joseph, L.A.H.Dubl. 1914, Tullow

Casey, Philip Forth, Irish Conjoint 1872, Kew Gardens
Clarke, James Kilian-Patrick Patrick, M.B.R.U.I. 1908, Oakham
Clarke, John Andrew, M.B.R.U.I. 1909, Dublin
Clerke, Jonathan, Scotch Conjoint 1886, Dublin
Collen, George Denbigh, M.B.Univ. Dubl. 1897, London, N.7
Condell, William Haskins, Irish Conjoint 1912, Hetton le Hole
Craig, Eric William, M.B.Univ. Dubl. 1915, Dublin
Crosbie, Frank, M.B.Univ. Dubl. 1911, Dundrum
Curry, Stephen Henry, Irish Conjoint 1902, London, S.W.
Curtin, Patrick James, Irish Conjoint 1885, Dublin

Devlin, Henry William, Irish Conjoint 1890, Ballygaveen
Dimond, William Elliot Randall, Irish Conjoint 1915, Maryborough
Dobbyn, Michael Gilbert, Irish Conjoint 1891, Bristol
Dooley, George Gerald, Irish Conjoint 1889, York
Dowling, Ignatius Alphonsus, Irish Conjoint 1911, Manchester
Doyle, Joseph Stanislaus, M.B.R.U.I. 1908, Enniscorthy
Dunlop, Joseph Everard, M.D.R.U.I. 1890, London, W.1
Dunlop, Peter, Scottish Conjoint 1882, London, E.7

Ennis, John Cormac, L.M.Univ.Dubl. 1895, London, W.1.

Falkiner, John McIntire, Irish Conjoint 1890, London, E.4
Fausset, Robert Rowley, Irish Conjoint 1909, London, W.
Foley, Cornelius, Irish Conjoint 1902, Horsley Woodhouse
Foley, Edward Green, Irish Conjoint 1914, Sutton Cross
Foran, John Joseph, Irish Conjoint 1911, Thornton Heath

Gubbins, Robert Joseph, Irish Conjoint. 1882, Kilmallock
Gwynn, Eileen Gertrude, M.B.Univ.Dubl. 1916, Dublin

Halpin, Richard Stopford Gilbert, M.B. Univ. Dubl. 1913, Neyland
Heron, James Mathew, M.D.Univ.Dubl. 1891, London, S.W.
Hill, John Francis, M.B.N.U.I. 1912, Cardiff
Holmes, Reginald, M.D.Univ.Dubl. 1907, Gravesend
Hopkins, Frederick, M.B.Belf. 1917, Belfast

Johnston, Robert Henry, M.B.Dubl. 1878, London, N.W.

Keane, Percival Maurice, Irish Conjoint 1907, Stoke Newington
Kelly, Richard, M.B.Univ.Dubl. 1905, Huddersfield
Kennedy, Arthur Patrick, Irish Conjoint 1913, Clonmel
Kilgariff, Joseph O'Loughlin, M.B.Univ. Dubl. 1889, Manchester
Kirwan, Frederick Michael, Irish Conjoint 1911, Limerick

Landy, Michael Joseph, M.B.R.U.I. 1903, Burnham
Lapper, Cecil Lindsay, Irish Conjoint 1912, Dublin
Latimer, Gordon Dill, M.B.Belf. 1913, Belfast
Levins, James Mary, Joseph Allen, L.A.H. Dubl. 1913, Dublin
Lyden, Michael Augustine, Scotch Conjoint 1881, London
Lynham, Bernard Malachy, Scotch Conjoint, 1917, Ballaghy
Lyons, John Francis, Irish Conjoint 1915, Clontarf

McCausland, Joseph, M.B.R.U.I. 1908, Raphoe
McCloy, John Moorcroft, M.B.R.U.I. 1909, Belfast
McCowe, Samuel, Scottish Conjoint 1882, Dublin
McCreery, Arthur Lonsdale, M.B.Belf. 1915, Belfast
MacErlean, Donagh Aloysius, M.B.N.U.I. 1913, Dublin
MacLulich, John Peers, M.B.Univ.Dubl. 1896, Edinburgh
MacMahon, Augustine Patrick, M.B.R.U.I. 1907, Dublin
McMurray, John, M.B.R.U.I. 1907, Manchester
MacSweeney, John Alphonsus, Irish Conjoint 1917, Dublin
MacSwiney, Thomas Stephen, M.B.R.U.I. 1891, Barnsley
McVittie, Arthur Craigie, M.B.Univ.Dubl. 1898, Rugeley
Maguire, William Joseph, M.B.R.U.I. 1894, Belfast
Minchin, Edward John, Irish Conjoint 1884, London, E.4
Montford, Archibald Henry, M.D.Univ.Dubl. 1875, Monkstown
Moorhead, William St. Leger, Irish Conjoint 1907, London, W.
Moriarty, James Joseph Patrick, M.B. N.U.I. 1915, Dublin
Mosley, Reginald Lawson, Irish Conjoint 1880, Long Eaton
Mulligan, Michael John, M.B.R.U.I. 1908, Athlone
Murphy, Walter Joseph, Irish Conjoint 1901, Ballinakill

Nicholson, John Francis, M.B.Univ.Dubl. 1903, Liscard

O'Callaghan, Maurice Ahern, Irish Conjoint 1911, Dalkey
O'Connell, Mathew Daniel, M.D.Belf. 1869, Tadcaster
O'Donoghue, James Bennett, L.A.H.Dubl. 1911, Dublin
O'Ferrall, Lewis Richard More, Irish Conjoint. 1899, Bristol
O'Gorman, Michael Charles, Irish Conjoint 1888, Aughrim
Oldham, Ralph Stransham, M.B.Univ.Dubl. 1906, Sutton
O'Kelly, John Joseph, Irish Conjoint. 1912, Dublin
O'Neill, James Arthur, L.A.H.Dubl. 1887, Colyton
Ormsby, William, Irish Conjoint. 1903, Roecommon
O'Reilly, Patrick Joseph, Irish Conjoint 1914, Dublin
O'Sullivan, Daniel, Scotch Conjoint 1884, Killarney

Parker, William Patrick Hugh, Irish Conjoint 1910, Glenageary
Patton, Grahame, Irish Conjoint 1908, Long Eaton
Pereira, John Michael, L.A.H.Dubl. 1913, London
Pierce, Michael Joseph, Irish Conjoint 1908, Wrexham
Phillips, Frank Gradt, Irish Conjoint 1919, Dublin

Porter, Joseph, M.B.Belf. 1913, Wigan
Purcell, Edward, Irish Conjoint 1905, Dublin

Quin, Henry Christian Ernest, Irish Conjoint 1901 Barnstaple

Raj, Balapershad Shiv, Scottish Conjoint 1913, Dublin
Rae, Robert James, M.B.Belf. 1914, Belfast
Redelinghuys, Antoine Chiappini, M.B.Univ. Dubl. 1912, Dublin
Rice William, Irish Conjoint 1901, London, E.
Richards, Charles Maurice, Irish Conjoint 1892, Cookstown
Richards, Henry Edward Sutherland, M.B. R.U.I. 1901, Liverpool
Richardson, Samuel Robert, M.D.Univ.Dubl. 1910, Dublin
Robinson, Edith, M.B.Belf. 1914, Whitehead
Robertson, Walter Bold, M.D.R.U.I. 1897, Belfast
Russell, Mortimer McGee, M.B.Univ.Dubl. 1916, Booterstown
Rutherford, William George, Irish Conjoint 1885, Hanslope
Ruttledge, Thomas Wilson, M.B.N.U.I. 1910, Dublin

Savage, John Joseph, Irish Conjoint. 1885, Rockferry
Scott, William Sydney Jebb, M.B.Univ.Dubl. 1881, Lymington
Sheffield, William Henry, M.B.R.U.I. 1909, London, E
Shortt, John William, Irish Conjoint. 1899, Southport
Sirnott, Thomas Joseph, Irish Conjoint 1913, Dublin
Smith, George, Irish Conjoint 1875, Southsea
Smullen, John Alexander, Irish Conjoint 1907, Dublin
Smyth, Frederick Gerald, M.B.Belf. 1915, Belfast
Smylie, John Dryden, M.D.Univ.Dubl. 1897, Dublin
Somerville, Thomas Townsend, Irish Conjoint 1871, Sheffield
Stubbs, John William Bolter, M.B.Univ. Dubl. 1913, Dublin
Sweeney, William David, Scottish Conjoint 1891, Manchester

Thompson, Gordon Moffat, M.B.Univ.Dubl. 1894, Liverpool
Thompson, Thomas Rolland Stewart, M.B. Belf. 1916, Belfast
Thunder, Wilfred, M.B.Univ.Dubl. 1904, Salop

Tidmarsh, James Moriarty, Irish Conjoint 1887, Luton
Tobias, William Oliver, M.B.Univ.Dubl. 1914, Dublin
Turrell, William, M.B.Belf. 1913, Belfast

Villiers, Henry John, Irish Conjoint 1915, Dublin

Wallace, Edward Chapman, Irish Conjoint 1911, Limerick
Wallace, Vivian, Irish Conjoint 1911, Multyfarnham
Walters, Mortimer, Irish Conjoint 1900, Dublin
Waters, Christopher, Irish Conjoint 1902, Dundrum
Watson, James Samuel, Irish Conjoint 1895, Poole
Weldon, Robert Percy, Irish Conjoint 1914, Epsom
White, Henry Heathcote, M.D.Univ.Dubl. 1905, Norwich
White, James Ross, M.B.Belf. 1912, Ballyshannon

Young, Charles Henry, M.B.Nat.U.Irel. 1918, Carrigaline

IMPERIAL CANCER RESEARCH FUND.

ANNUAL MEETING.

THE eighteenth annual meeting of the Imperial Cancer Research Fund was held on July 22nd at the Examination Hall, Queen Square, Bloomsbury, when the DUKE OF BEDFORD presided. Among those present were Sir Norman Moore, Sir William Church, Sir George Makins, Sir Frederick Andrewes, Sir John Bland-Sutton, Sir Rickman Godlee, Sir John Tweedy, Dr. Wm. Bulloch, Sir G. Sims Woodhead, Dr. J. A. Murray (Director), Dr. B. R. G. Russell, Dr. W. Cramer, and Mr. F. G. Hallett (Secretary).

Director's Report.

Sir WILLIAM CHURCH, in moving the adoption of the report, gave a summary of the investigations during the past year, in which he stated that the Director had continued the autologous grafting experiments, in which by transplanting an animal's own tumour to a part of its body away from the site of the primary growth an artificial secondary growth is established. The formation of secondary growths was the most certain evidence of the cancerous nature of a growth. It was to be hoped, therefore, that this method would be more widely applied as a control in the experiments on the production of cancer by chronic irritants which were being undertaken in so many laboratories throughout the world. In these experiments the most definite proof of malignancy was essential to progress. Dr. Cramer (continued Sir William Church) has examined the action of a number of inorganic substances on cancer cells. The first step in these investigations is to expose emulsions of a transplantable tumour to the reagent in the test tube and find out by inoculating the treated emulsion into susceptible animals the amount of damage produced. Salts of cerium were found to be the most active of those tested. Manganese and uranium salts were less potent, and the other elements experimented with were without effect in strengths which could be tolerated by the experimental animals. None of these substances, however, had any influence on growing tumours—a failure probably due to the irregularity of the circulation in the tumours, which delays the access of the reagents to the cells, coupled with their rapid elimination by the kidneys and bowels. This is one of the difficulties which is constantly met with in direct therapeutic experiments on cancer. The cancer cell is so like the normal cells of the body that agencies which destroy it are also dangerous to life. Before we can plan a rational method of treatment it will be necessary to know more of the vital processes in cancer cells and the nature of the very delicate differences between them and the normal. A beginning has been made with the study of cell respiration. Respiration is essentially a combustion process, oxygen being taken in and carbon dioxide given off. These are only the first and last terms, however, of a series of chemical equations, so that there is room for great variety in the intermediate stages, even if the final result should be the same. Dr. Drew has approached the problem by studying the rate of decolorization of dilute methylene blue solution by normal and cancer cells. With this method there is a wide difference between the two, decolorization being much more rapid with normal cells. Dr. Russell and Dr. Gye have suspended the tissue emulsions in fully oxygenated defibrinated blood and measured the rate at which oxygen is abstracted on incubation at body temperature. By this second method the differences are much less pronounced, and it is found that the more rapidly growing tumours, with significant exceptions, absorb more oxygen than those which grow slowly. The investigations are being continued, and give promise of interesting light on this fundamental feature of the life of cancer cells.

The DUKE OF BEDFORD, in moving a vote of thanks to the Executive Committee and others who have assisted in the work of the Fund during the past year, referred to the wide range of investigation covering such important researches as those relating to (1) experimental induction of cancer; (2) respiration in normal tissues, which is a fresh line of research in connexion with cancer; and (3) experiments on the action of chemical substances on cancer cells in the test tube and in the body, and the very technical investigation of the Director on grafting; he noticed with satisfaction that the Fund is again in a position to assist investigators at home and abroad with tumour material for experimental purposes. Speaking of the finances of the Fund, he mentioned that increased expenditure was caused by the full resumption of laboratory research work as well as the enhanced cost of materials. The fixed income of the Fund was £5,550, whereas the expenditure was £7,000, the difference this year being met by a certain number of subscriptions and legacies. The Fund requires at least £1,500 a year more to maintain the researches. He referred to the valuable services of Sir Watson Cheyne, who had resigned the post of honorary treasurer, in which he is succeeded by Sir George Makins.

Secretary's Report.

The Secretary's report gives a list of the papers published from the laboratory during the year, including Dr. J. A. Murray's opening paper on the present position of cancer research, read before the Section of Pathology and Bacteriology at the Annual Meeting of the British Medical Association in Cambridge this summer. Through the kindness of Professor J. Fibiger, of Copenhagen, the scientific staff of the Fund have received a number of mice infected with *Spiroptera neoplastica*, to enable them to repeat his work on the experimental production of cancer. The investigations are being carried out with the collaboration of Dr. R. T. Leiper of the London School of Tropical Medicine. In October last a small subcommittee was appointed to consider a revised scale of remuneration for the laboratory staff to meet the increased cost of living. Their report was unanimously adopted, and the new scale of payment is stated to have caused much satisfaction among the staff.

A vote of thanks to the Duke of Bedford for his constant support of the work of the Fund having been adopted, the proceedings terminated.

British Medical Journal.

SATURDAY, JULY 31ST, 1920.

POST-GRADUATE SPECIALIZATION.

IN our issue of June 19th Sir Humphry Rolleston and Mr. Waring described a system of post-graduate instruction which, at least upon the scale indicated, is unfamiliar in this country. It is, as the authors observe, surprising that so many as four thousand American medical men should be able to devote three years to a course of training demanding the whole time of the student in return for less than a maintenance allowance. Assuming that the majority of the students had recently graduated and that the seven years' undergraduate course of the University of Minnesota is typical of the schools whose pupils are concerned, ten years must elapse between the commencement of university study and the receipt of a diploma which will be formally equivalent to our F.R.C.S. or M.R.C.P. The span of years is formidable, but it may be doubted whether in our own country the novitiate of the specialist has been much shorter. Very few men have obtained a junior visiting staff appointment within five years of graduation; few of these earn a living wage from their speciality within another two or three years. It is, therefore, not the length of the apprenticeship but its form which is in question.

Those who had the privilege of hearing Dr. Arnold Chaplin's paper on medical education in the universities of Oxford and Cambridge, at a recent meeting of the section of the History of Medicine of the Royal Society of Medicine, and the readers of the articles on the early days of the Cambridge school, contributed to our columns by Dr. F. J. Allen, will have been impressed by the contrast between the ancient and the modern systems. In effect the old system was, or professed to be, a training in principles; modern medical education is devoted to the acquirement of technique. The modern reader who shudders in face of the massive folios of the Juntas' Galen and cannot stomach even the twenty odd octavos of Kuehn's edition, may fairly doubt whether, despite university statutes and regulations of the College of Physicians, doctors in the eighteenth century did master the usually acute but frequently incorrect and always verbose teaching of the Pergamite. But it is certain that the doctrine which gives a name to one of Galen's more agreeable essays ("That the best physician is also a philosopher"), and is reiterated in all his works, *was* generally believed. To this belief we doubtless owe much hardly tolerable theorizing; also perhaps something we can less gladly spare.

We have quoted before in these columns Samuel Johnson's dictum that an Athenian blockhead is the worst of blockheads. Sir James Mackenzie has demonstrated, both by precept and example, that a wide non-specialized experience prepares the intellectual soil for the cultivation of choice flowers which hothouses of the most improved technical finish have not reared. Can it be possible that the very considerable demand for "advanced and intensive graduate education" which has surprised Sir Humphry Rolleston and Mr. Waring is not altogether a good thing? We do not wish to be understood to speak scornfully of technical acquirements, still less to be regarded as adherents of the armchair medical philosophers who excited Sydenham's contempt. But we think there is a tendency to overrate the importance of technique, and that intensive graduate education of the kind adumbrated in the American scheme is not so wholly admirable as some may be inclined to assume.

"It would be well," said an early Victorian author (Sewell), "to impress on the young men of the present day the value of ignorance, as well as of knowledge; to give them fortitude and courage enough to acknowledge that there are books which they have not read and sciences which they do not wish to learn, and to make them feel that one of the very greatest defects in a mind is want of unity of purpose, and that everything which betrays this betrays also want of resolution and energy." There are two ways of applying this moral to the difficult art of medicine. One is to seek rigorous specialization, to impress upon the student the difficulty of technique, and to encourage him to devote his whole energies to a particular branch. It is the easier path to follow, but it may end in the plain which was the site of the tower of Babel. We remember a meeting of the Royal Society at which a paper by a famous physicist and a communication by an equally eminent physiologist were to be read. At the commencement of the proceedings some fifty Fellows were in the room. When the physicist sat down, the voice of a secretary reading the title of the next paper was lost amid the rustling of forty-four Fellows on their way to the door. No disrespect to the physiologist was intended; it was a mere recognition of mutual incomprehensibility. This is, perhaps, inevitable in a society which takes all natural knowledge for its province; it ought not to be inevitable within the bounds of our profession. Yet we have heard many Fellows of the Royal Society of Medicine confess that a large proportion of the papers read in sections other than that dealing with their speciality are to them mere sound and fury. Even within one and the same section secretaries have sometimes been hard put to it to secure speakers in the discussion of particular papers. This way of avoiding Sewell's moral weakness must end in the destruction of catholicity and be worse than the evil of a slovenly omniscience at which his censure was aimed.

There remains an alternative—the realization of the solidarity of the whole science of medicine. The young man or woman who is fortunate enough to be able to devote some years to post-graduate education and follows the lines of the "Alabama Student" of Osler's biography will surely have chosen the better part. A wide basis of experience, the synthesis of such experience into a general philosophy of medicine—a synthesis each must perform for himself—is the proper training of a physician, and has indeed been the foundation upon which nearly all who have achieved eminent success in particular techniques have built. Real mastery of a technique is not obtained in three or in thirteen years of intensive training; dexterity may be so acquired, but not judgement. It is not true that working twelve hours a day for a year at a subject has as good an effect as working three hours a day for four years. We believe that a post-graduate system which ignores these aspects of the matter is unsound, and we hope that any organization of higher teaching in this country will give due weight to what Sir George Newman terms the integrative side of medical education.

UNIVERSITY OF LONDON SITES.

THE Senate of the University of London, at its meeting on July 21st, requested the Government to keep open its offer of a site in Bloomsbury; in view of the important issues involved, and the uncertainty as to the nature of the offer in many respects, more time is desired for further consideration and consultation with the Government. The site offered in Bloomsbury, to the north of the British Museum, covers 11½ acres, but owing to the space occupied by roads and to conditions under which certain houses on the site are held, it is said that the actual area presently available does not exceed 8⅓ acres. The value of this has been estimated at half a million.

The decision is affected by the Government's proposal that King's College should vacate its present site in the Strand, and rebuild on part of the Bloomsbury site. King's College holds its site in the Strand on lease from the Government for 999 years at a nominal rent of £1 a year; the valuer of the London County Council therefore regards it as a tenure in perpetuity. At present it can only be used for purposes of education, but were the property surrendered to the Government its full economic value could be developed. The President of the Board of Education has informed the University that the Government is prepared to recognize its responsibility as regards maintenance, rates, etc., for the university head quarters, and to arrange for the payment of an annual sum from votes of Parliament to meet the cost of these services, now received in kind. The Government promises also that when the time comes for King's College to vacate the Strand buildings and remove to the new site in Bloomsbury, it will be prepared to seek the authority of Parliament to purchase the King's College buildings on the Strand site at a fair valuation. The London County Council valuer is of opinion that the King's College site is worth to the Government between £800,000 and £1,000,000. Mr. Fisher, in concluding his letter, expressed the opinion that the Government, in offering the Bloomsbury site, was affording the university "a unique opportunity of developing in new surroundings in a manner worthy of the name it bears."

The Government has in form made a single offer, but it is, in fact, double, and the two parts should be disentangled. The one part is an offer to the university of a free site for its head quarters. Assuming that the large sum for buildings could be raised, the offer is tempting, for the site is central, and the university at present only has the use of part of the Imperial Institute on sufferance. The other part of the offer, though made to the university, really concerns King's College. We are prepared to agree that the present site of King's College is wholly unsuitable, but it does not follow, as Mr. Fisher appears to assume, that to transfer it to Bloomsbury, where it would be cheek by jowl with University College, is the only alternative. Why should not King's College go to London south of the Thames, where there is a population of two or three million without a university college? King's College has many faculties, and we do not wish to attach undue importance to the medical, but the fact that its hospital has gone to the south of the Thames affords some indication of the trend of opinion among those who realize the needs of south London; if that district needs a university hospital, does it not also need a university college?

The university at present, as has been said, occupies its head quarters at South Kensington free, and the Government does not offer to find the cost of building new head quarters in Bloomsbury. It appears, therefore, that the Senate is fully justified in looking this gift horse in the mouth. The advantages of having a university in so central and appropriate a part as Bloomsbury are very great, but it must be admitted that there are serious objections. Setting aside for the moment the financial question—the recent experiences of other universities in appealing for large funds have not been encouraging—there is a fundamental doubt whether the site in Bloomsbury is large enough. On this point there comes opportunely the reprint of an address on the university problem delivered by Sir Edward Sharpey Schafer to the Welsh Medical School last January. His contention is that a university, if it is to have a prudent eye to the future, ought to have possession of a site of 100 acres or more, and he points to the example of the universities in the United States, and recently of his own university. Fortunately, he says, for the future of Edinburgh, the present head of the university has been able to look into the future, and has persuaded the governing body to purchase a plot of land of about 115 acres on the outskirts of the city. We have already described this estate, and it will be remembered that it is not more than a mile from the existing university. It has cost £28,000, but 2½ acres of town land will cost £55,000. The first thing, he says, that the founders of a university on the other side of the Atlantic generally do is to provide the future institution with enough land, not only for its immediate needs, but for any future expansion that can be foreseen. The campus of many an American university is one of the most beautiful features of the city. It is laid out as a park with abundant stretches of greensward and avenues of trees. On appropriate sites in the university part libraries, lecture rooms and laboratories, students' hostels, athletic grounds, and houses for the professors and lecturers are provided. He conceives a university thus self-contained as a small city in itself, within which not only means for instruction, but also for recreation and amusement, are provided. On such a site, he goes on to point out, laboratories, with adequate facilities not only for teaching but for research, might be constructed on an inexpensive plan, but one allowing ample opportunity of expansion as necessity arises in the future. These opinions, coming from one of so much experience and with vision so far-seeing, are worthy of the most anxious consideration of the Government and the University of London.

It is said that there is a possible alternative site in the Kenwood estate of about 220 acres on the high ground between Hampstead and Highgate, but here again more precise definition appears necessary. For what purpose is so large a site needed? If merely for the central office of a university it would be far too large and out of the way. It would indeed fulfil all the requirements laid down by Sir Edward Sharpey Schafer. But is it proposed to establish another university college at Kenwood?

LORD HERBERT OF LEA.

AT the dinner given to the Army Medical Department Sir Alfred Keogh spoke of the debt that military medicine owes to Lord Herbert of Lea. His statue stands beside Florence Nightingale's in front of the Guards' Crimea Memorial in Waterloo Place, but few passers-by know why. There are still fewer who can believe that a Secretary for War during the Crimea is worthy of a memorial at all. Yet it was Sidney Herbert who first listened with understanding to the grievous reports of crippled medical

services and avoidable suffering in the Crimea. It was he who sent out Florence Nightingale and gave her orders to communicate direct with him, then Secretary of State for War. It was he who, knowing her limitations, none the less turned her great powers of observation to the best account through the filter of his own still greater wisdom. When the Ministry of which he was a member fell Herbert continued to be the principal adviser to the succeeding Government on everything which concerned the medical service. Never was there a wiser or saner adviser to any Cabinet responsible for the conduct of war. He had realized very early in the Crimean campaign that it would "require and exhaust not only all the medical ability of our army, but of the medical profession generally, and we must get the best advice and skill which can be got, so long as it can be got. Clearly," he wrote, "we do not do that if we exclude from our ranks all but those who are young enough or needy enough to accept an acting surgeon's commission. . . . We must carry the introduction of civilians with acting commissions one step higher. . . . We must introduce civilians of higher rank and give not only acting surgeoncies but acting deputy inspectorships. . . . We may ultimately be reduced to have hospitals managed by civilians, just as we have sometimes dépôts and even regiments attended by civilians." Herbert realized how necessary it was that army doctors, whether regular or temporary, should be given military rank. "In a military body," said he, "no position can be secure without rank, for in it there can be no overwhelming force of opinion to confer socially or by custom what authority withholds." He saw clearly and urged forcibly the importance of retaining men of experience for professional work and not confining the higher ranks to administrative duties. The question has never been more brilliantly expounded. He pointed out that a director-general of the day had a singular conception of the duties of a physician or surgeon which was peculiar to the Army Medical Department. "It has been held that young men should practise, operate and prescribe; but that the higher ranks should be confined to what have been considered the higher duties of administration. A very grand name for very humble offices. To the surgeon very properly, to the assistant-surgeon very improperly, have been made over the knife, the pharmacopoeia, and the *corpus vile* of the British soldier. To the experienced physician and skilled surgeon—namely, to the inspector or deputy-inspector—have been entrusted the sacred inspection of stores, the cleanliness of wards, the filling up of returns, the countersigning of requisitions, the necessity of which he has less means of judging than the prescribing officer, the supervision of washing and even of washerwomen: in short, all the dealings with buildings, with furniture, with stores, with pots and pans, which in civil hospitals are the province of a house-steward, a matron, or a housemaid. . . . Imagine Sir Benjamin Brodie withdrawn from the bedsides or the theatre at St. George's and in virtue of his experience and ability set to overlook accounts, countersign demands for extras, check the issue of stores, and see that the broom and scrubbing-brush have been properly applied." Sidney Herbert saw further than this. Apart from the advisability of encouraging medical officers to use their professional skill and experience in the healing of the sick and wounded, he realized far in advance of his day the value of preventive medicine. "Prevention gives us soldiers, cure gives us pensioners." Expanding this aphorism, he wrote: "For the mere purpose of the campaign, putting aside humanity and duty to the soldier, the success or failure of the remedy is not very material. Indeed, death affects an army less than disease. For death only diminishes numbers, whereas disease not only diminishes numbers, but detracts from the efficiency of the remainder who are still unaffected by it. The hospital intercepts rations, transports, guards, surgeons, money, all of which are wanted to maintain in efficiency an army at the front." Herbert had large views as to the powers which a director-general should possess. He wanted him to be an autocrat in matters medical, but an autocrat with specialist advisers. "If I require undivided responsibility, I must give my autocrat every means of coming to a right decision." For this purpose he suggested three equal subordinates who should be given high rank and be (under the director-general) heads of three independent departments: statistical, medical, and sanitary. Sixty years later we find these proposals carried in some measure into effect in the shape of the appointment of directors of hygiene and pathology. But nowhere is the wisdom and sweet reasonableness of Sidney Herbert better exemplified than in his advice to Florence Nightingale, who with all her gifts certainly lacked his patience and his reasonableness. Her judgement was often harsh and her statements exaggerated. He wrote plainly to her of her failings: "You will have read McNeill's and Tulloch's report. It is a signal illustration of what I mean. There is not a hard word in it, or an epithet, not an accusation, scarcely an animadversion, but the sobriety of tone has arrested the attention and conquered the confidence of the public, and they have made the necessary inferences, and pretty broad ones too. The fact is the public like to have something left to their own imagination, and are pleased with their own sagacity when they have found out what is too obvious to be missed. It is always wise, too, in a public document to understate your case. If on examination your case proves stronger than you have stated it you reap the whole advantage. If, however, any part, however slight, is shaken, the credit of the whole is shaken with it. My moral is that you must write more calmly, and not yourself accuse or attribute motives to those whose misstatements you may disprove and whose misconduct you may expose without either, and do it far more effectively too." It was a happy inspiration that led Sir Alfred Keogh to recall to memory the debt of the Army Medical Service to Lord Herbert of Lea.

INTERNATIONAL JOURNAL OF PUBLIC HEALTH.

A NEW publication, the *International Journal of Public Health*, makes its appearance this month. It is intended to be the official scientific organ of the League of Red Cross Societies, whose official lay publication, the *Bulletin of the League of Red Cross Societies*, has been appearing monthly since May, 1919, and has often been mentioned in these columns. The production of two periodicals, the one scientific and technical, making its appeal to professional workers in public health and preventive medicine, and the other popular, was decided on at the Cannes Conference in April, 1919. Both journals are edited and published in the Department of Medical Information at the head quarters of the League in Geneva. It is proposed to print in the new journal original articles of scientific and practical import, critical reviews on subjects of timely interest, abstracts of important articles appearing in other special journals and in general medical literature, and demographical notes and statistics bearing on health conditions in all parts of the world. The first number keeps to this programme in very workmanlike fashion. For the present the journal will be published every two months and will appear in four languages—English, French, Italian, and Spanish—each edition containing the same material. The titles of the four editions are respectively *International Journal of Public Health*, *Revue Internationale de l'Hygiène Publique*, *Rivista Internazionale di Sanità Publica*, and *Revista Internacional de Sanidad*. We can bear out the Editor in his belief that this is an undertaking never before attempted on so large a scale in a scientific journal, and we are glad to wish it all success. The toil, to say nothing of the cost, must be very great. Dr. Emile Roux gives his blessing to the first number, which contains

articles by Professor Calmette on the protection of mankind against tuberculosis, by Dr. Richard P. Strong on the antityphus campaign, by Dr. D'Espine on the use of "protein milk," by Dr. G. Whipple on world sanitation, and by Dr. Tropeano on social medicine. The demographical notes form a valuable feature, and are under the charge of Dr. Knud Stouman, who gives tables of births and deaths in various European countries during the war and makes many significant remarks thereupon. The editorial staff has at its head Dr. Thomas R. Brown, with Dr. W. W. Francis as associate editor, and six assistant editors. The first three numbers will be distributed free to organizations and individuals in all parts of the world actively interested in public health matters. Beginning with the fourth issue the subscription rate will be 20s. a year, or the approximate normal equivalent in the currency of the subscriber's country.

THE PLIGHT OF PETROGRAD DOCTORS.

THE state of affairs among the doctors in Petrograd is reported by the *Tidsskrift for den Norske Laegeforening* of June 15th to be most distressing. During the recent epidemic of typhus the mortality among the doctors in attendance was between 45 and 50 per cent., whereas the mortality for the whole of Petrograd's population was only between 8 and 9 per cent. The doctors have been nationalized, are regarded as the Government's employees, and are disqualified from earning an independent living. Their official monthly wage is, on the average, between 5,000 and 6,000 roubles *plus* a double food ration, which includes half a pound of bread a day; they are entitled also to one public meal a day, consisting of soup and horse flesh. On this dietary the doctors in Petrograd have, during the past two years, carried out most onerous duties which have been augmented by epidemics of cholera and dysentery in the summer and of small-pox and typhus in the winter. Of the 4,000 doctors resident in Petrograd before the war only about 800 are left; most of the rest have died of starvation, overwork and epidemic diseases. Their work has generally to be done on foot. The trams are so lice-infested that their use entails grave risks of typhus, and the cost of a horse and vehicle is about 2,000 roubles an hour. The few motor cars in existence are not available for doctors.

VOLUNTARY WAR HOSPITALS.

DURING the war 3,244 private houses were established and maintained as hospitals for the treatment of officers and men of the army, their distribution in areas being as follows: Aldershot Command, 40; Eastern Command, 687; Irish Command, 105; London District, 352; Northern Command, 439; Scottish Command, 314; Southern Command, 660; Western Command, 637; Guernsey and Alderney District, 6; Jersey Command, 4. The work of the hospitals having now been practically completed, the Army Council, in the name of the nation, has placed on record its thanks to those whose generosity made the work possible, and the Council is also issuing an inscribed scroll which may be hung in each building as a permanent memorial of the patriotic purpose to which it was devoted in 1914–1919. The inscription is as follows:

> During the Great War of 1914–1919 this building was established and maintained as a Hospital for British sick and wounded: The Army Council in the name of the Nation thank those who have rendered to it this valuable and patriotic assistance in the hour of its emergency, and they desire also to express their deep appreciation of the whole-hearted attention which the staff of this hospital gave to the patients who were under their care. The War has once again called upon the devotion and self-sacrifice of British men and women, and the Nation will remember with pride and gratitude their willing and inestimable service.

More than 500 scrolls have already been issued, and the remainder are being dispatched within the next few weeks.

"MEDICAL REGISTER": CHANGE OF ADDRESS.

SOME weeks ago (June 19th, p. 841) we drew the attention of every medical practitioner to the necessity in his own interest of informing the General Medical Council of any change of permanent address, as otherwise his name may be erased from the *Medical Register*, and he will be put to trouble in getting it restored and be required to pay a fee of £1—trouble and expense that may easily be avoided by prompt notification to the Registrar. We now, at the request of the Council, as a special measure which is not likely to be repeated, publish a list of practitioners who cannot be traced, which will be found at p. 171. It is probable, in many instances, that the practitioner died during the war and that the death was not reported; in others it is possible that the practitioner has gone abroad. Any of those who find their names in this list should immediately communicate with the Registrar concerned; information from friends of deceased persons or others will also be welcomed. There is another matter to which it is desired in the interest of practitioners to draw special attention. It is by no means unusual for persons to practise under names which differ in some particular from those appearing on the *Register*. Sometimes Christian names or initials are dropped or added; sometimes hyphenated names are used. It is now the custom for the Ministry of Health and various public officials to consult the *Register* regularly, and to decline to recognize anyone by a name which is not that registered. Therefore those who have made an alteration in name should take the necessary steps to have the matter put in order by causing a corresponding alteration to be made in the books of all the bodies whose qualifications they hold, and by notifying the fact to the Registrar concerned. The General Medical Council charges a fee of 6s. for making the change, which involves some expense to it, and the fee includes the Government stamp of 1s. for a certified extract from the *Register* as corrected.

Medical Notes in Parliament.

The Proprietary Medicines Bill.

OUR Lobby correspondent writes: In the Memorandum explanatory of the text of the Proprietary Medicines Bill, which was issued on July 27th, Lord Astor states that its object is to give effect to the recommendations of the House of Commons Select Committee who reported early in August, 1914. The measure, he says, contains no provision which was not specifically recommended by the Select Committee, and it includes all their more important recommendations, so far as they fall within the province of the Ministry of Health. A comparison of the actual proposals of the Government with the findings and recommendations of the Committee will confirm this observation. But drafting necessities and other considerations, some of them evidently arising from a desire to get simple and quick working in administration, cause the two documents—the bill and the Committee's report upon which it is based—to have a different appearance and vary in certain particulars. Before noticing the essential unity and the minor divergencies it is well to recall the circumstances which account for the presentation of the measure at the present time. The Select Committee, of which Sir Henry Norman was chairman, began its investigations in May, 1912, and concluded them, as already mentioned, at the beginning of August, 1914—that is, a few days before the declaration of war. The report was issued on August 26th, 1914,[1] when the attention of everyone was concentrated on the war. That being the case it could not then be taken up. The findings of the Committee, which followed on the hearing of varied and voluminous evidence, formed the basis of these recommendations for legislative enactments. The Committee had found that there was a large and increasing sale in this country of patent and proprietary remedies and appliances and medicated wines. They

[1] BRITISH MEDICAL JOURNAL, August 29th, 1914, p. 404.

further found that these remedies were of a widely differing character: (*a*) genuine scientific preparations; (*b*) unobjectionable remedies for simple ailments; and (*c*) many secret remedies, making grossly exaggerated claims of efficacy, causing injury by leading sick persons to delay in securing medical treatment, containing in disguise large proportions of alcohol, sold for improper medication, professing to cure diseases incurable by medication, or essentially or deliberately fraudulent. The Committee went on to declare that the last mentioned class (*c*) constituted a grave and widespread public evil, and after pointing out that the existing law was chaotic and had proved inoperative in regard to these matters, they held that amendment of the law was urgently needed. The Committee afterwards proceeded to set forth what changes in the law they thought could be made, and here it may be well to summarize briefly the clauses of the bill. The Government propose that no one shall manufacture or prepare for sale any proprietary medicine or any proprietary surgical appliance unless he be registered under the Act for the purpose; unless the medicine or appliance be registered under the Act; and unless, in the case of a medicine, it is compounded of the ingredients and in the proportions specified, and in the case of an appliance corresponds to the specimen furnished. Registration is to be signified on the medicine or article by a number. The section prohibiting sale save under these conditions is to operate six months after notice in the *London Gazette* that applications for registration will be received. In the second clause it is laid down that after six months from the passing of the Act it shall not be lawful to sell any medicine or surgical appliance purporting to prevent cure or relieve any of the diseases or infirmities mentioned in the schedules. These are enumerated as follows: Cancer, consumption, lupus, deafness, fits, epilepsy, amenorrhoea and other diseases peculiar to women, diabetes, paralysis, locomotor ataxy, Bright's disease, rupture. Power is reserved to the Minister to extend the schedule. In the same clause prohibition is made against the advertisement of any article which might be used for abortion or miscarriage. The third clause deals with offences connected with advertisements. It sets forth as misdemeanours invitations by correspondence to take up remedies; the use of fictitious or misleading testimonials; the issue of a statement that a medicine or appliance is recommended by a duly qualified medical practitioner without including in the particulars names and qualifications, and, in the case of a living person, the address of a practitioner; the publication of a false statement that a medicine or appliance was discovered, invented, or compounded by a medical practitioner. The fourth clause provides for the keeping by the Ministry of Health of a confidential register, security being afforded against the divulgence of ingredients of a medicine. The fifth clause is an enabling one for the Minister to make regulations, and these are to be laid before Parliament. The regulations will, *inter alia*, allow the Minister, if he thinks fit, to direct that the name and quantity of any poisonous or dangerous drug forming an ingredient in any registered medicine shall be stated on the vessel or package, and will require that every proprietary medicine containing more alcohol than the Minister deems to be properly contained therein shall show on its vessel or package the proportion of alcohol contained. Another regulation is to be made to prohibit any statement being made by an owner that a medicine or appliance possesses any therapeutic qualities other than such qualities as are specified in the register as being its therapeutic qualities. The Minister is to have authority to remove any medicine or appliance from the register subject to appeal to the High Court against such removal. The penalties laid down for misdemeanours are imprisonment for a term not exceeding twelve months or a fine not exceeding £100, or both such imprisonment and fine. If a person be guilty of any other offence under the Act he is to be liable on summary conviction to a fine not exceeding £20, with a further fine not exceeding £5 a day for each day during which an offence continues after conviction. There are saving clauses for sales on medical prescriptions and for the sales of existing stocks bought by the vendor before July 24th, 1920. The expression "proprietary surgical appliance" is partly defined as one which is sold under a trade name or a trade mark with claim for exclusive rights and recommendation for curative purposes. The principal difference in the text of the bill from the recommendations of the Committee is as regards procedure. The Committee recommended that a special court or commission should be constituted with power to permit or prohibit, in the public interest or on the grounds of non-compliance with the law, the sale or advertisement of any remedy or appliance; and that the Commission should be a judicial authority such as the metropolitan police magistrate sitting with two assessors, one appointed by the department, and one by some such body as the London Chamber of Commerce. The bill makes the power to remove medicines and appliances from the register to reside in the Minister subject to the same right of appeal to the High Court which the Committee recommended. In the schedule the Committee appended against the word "rupture" the parenthetic phrase "(without operation or appliance)."

An Attack on Medical Appeal Boards.

Mr. C. Edwards asked, on July 22nd, if the Minister of Pensions was aware that great dissatisfaction existed among ex-service men through the decisions of the medical appeal tribunals, which deprived them of any further pensions, notwithstanding the fact that many of these men were now unable to do the same work as before, and could do only work of a less arduous nature at much lower wages than their former employment would now bring them in; whether many were discharged as totally unfit for further service yet the result of the appeal tribunal was the same; how these tribunals were appointed; whether they were permanently employed; and what instructions were given them as to these examinations. Mr. Edwards also asked if the Minister would set up another tribunal with power fully to investigate the former condition of these men as regards health for comparative purposes when the final examination was being made. Mr. Macpherson said he was not aware of any grounds for thinking that the arrangements for appeal to medical appeal boards were working otherwise than satisfactorily. These boards were constituted to give both disabled men and the Ministry the advantage of the advice of specialists in the various classes of disability, and the specialist was always a member of an appeal board. Members were appointed by the Minister, and, apart from the Deputy Commissioner of Medical Services of the area, who was a whole-time officer—they were remunerated on the basis of a fee per session. None of the members was in the permanent employ of the Ministry. No special instructions had been given to the appeal board which would interfere with their unfettered judgement, and in the circumstances he could see no advantage in constituting a new tribunal. The accepted basis of the award of disablement pension was the medical estimate of the extent of the disablement consequent upon the disability found to be due to the man's war service. Considerations as to the wages which a pensioner was capable of earning (which under the present system were expressly excluded from the assessment of pension) could not reasonably be introduced in those cases only where they would be to the man's advantage.

National Health Insurance: Referee Consultants.—Sir J. D. Rees asked, on July 26th, whether thirty-two doctors at £1,000 a year were being appointed to work under the direction of the Minister of Health. Dr. Addison replied that that was so. They were appointed to act as referee consultants under the National Health Insurance scheme with the object of protecting insurance funds from unnecessary claims to sickness benefit and improving the general standard of insurance medical practice. Funds for this purpose were voted by Parliament in 1914, but not spent during the war owing to the impossibility of establishing this much-needed extension of the health insurance medical service during that time.

Small-pox in Glasgow.—Mr. R. Young asked, on July 23rd, in reference to the Glasgow small-pox outbreak, whether any of the cases or deaths, given in the return for July 12th, 1920, as unvaccinated, had been vaccinated at any time either before the development of the disease or during its course. Mr. Munro replied that in the return mentioned, the classification of "unvaccinated" and "vaccinated" was determined by the condition at the date of exposure to infection. Of the 88 cases included under the heading "unvaccinated," 15 were vaccinated between exposure to infection and development of the disease, 14 successfully and one unsuccessfully. Of these 15 cases two died. One was a child, aged 2 months, who had been successfully vaccinated, and the other, aged 6 years, had been unsuccessfully vaccinated four days before the disease developed.

Dangerous Drugs Bill.—A House of Commons Committee, to which this bill was referred, twice failed to form a quorum; but the bill, which has been framed to give effect to the International Opium Convention, was considered on July 27th, and passed the Committee stage.

The Definition of Charity for Income Tax.—Sir H. Nield asked the Chancellor of the Exchequer, on July 22nd, if he would consider the desirability of inserting a clause in the Finance Bill which would more clearly define what was a "charity" within the meaning of the existing Finance Acts, so that institutions not run for profit yet deriving a portion of their incomes from relatives and friends of the inmates, might be exempted from payment of income tax under Schedule A on freehold and leasehold properties, purchased by them out of funds subscribed by the public, or from testamentary bequests, and from payment of tax under Schedule D on dividends from investments similarly acquired. Mr. Chamberlain replied that the legal definition of the term "charity" was considered by the Royal Commission on Income Tax, who expressed the opinion that for the purposes of income tax a "charity" should be specially defined by Parliament. This and other suggestions made by the Royal Commission (in Section 14 of Part 3) of the report in regard to the income tax exemptions that were granted to charities, would be considered when it was possible to deal with the Royal Commission's recommendations which were still outstanding.

Women Doctors and Income Tax.—Captain Elliot asked, on July 20th, why women doctors who were serving at home on whole-time contracts, but were told off to attend female units such as Queen Mary's Army Auxiliary Corps, had been refused the income tax concession which was granted to other persons who were doing work of a military character. Mr. Chamberlain replied that civilian doctors, whether men or women, detailed to attend units such as Queen Mary's Army Auxiliary Corps in this country, could not be regarded as entitled to income tax reliefs which under Section 42 of the Income Tax Act, 1918, were allowed to soldiers and sailors and others who were performing service of a naval or military character in the war.

Neurasthenic Cases in Manchester.—Dr. B. McDonald asked, on July 22nd, if the attention of the Minister of Pensions had been drawn to the "callous manner" in which neurasthenic cases were treated by the Manchester Medical Board; and if he would issue instructions that greater consideration be extended to these shattered men. Mr. Macpherson replied that no complaint whatever had been received by the Minister at head quarters or by the regional director which would support the suggestion that the special board which examined neurasthenic cases in Manchester dealt otherwise than with tact and consideration with the cases that came before them. If, however, Dr. McDonald had any specific instances in mind he would be glad to inquire into them at once.

Provision for Neurasthenics in Ireland.—Sir Robert Woods asked, on July 22nd, whether for the three southern provinces of Ireland the only institution for the treatment of discharged soldiers suffering from neurasthenia was Leopardstown Park, county Dublin; if the accommodation was limited to thirty-five patients; and if there were at present awaiting admission there 248 men for whom treatment in that place had been recommended. Mr. Macpherson replied that the facts were substantially as stated. Arrangements were, however, in progress to provide accommodation at Leopardstown Park for an additional 50 patients, and the question of providing further facilities for the treatment of this class of patient was engaging his earnest attention. Considerable local difficulties had to be contended with, but everything possible would be done to meet the situation.

Reduction of Disablement Pensions.—Captain Bowyer asked, on July 22nd, whether the Minister of Pensions was aware that numerous cases of complaint had arisen with regard to the cutting down of the pensions of disabled soldiers irrespective of, and without apparent reference to, the awards of medical boards; on what principle such pensions were cut down; and whether he would undertake that in future, where the disability remained constant or increased, the pension should also remain constant or be increased. Mr. Macpherson replied that he was not aware of the numerous cases of complaint suggested. All the awards of pensions under the Royal Warrant were in accordance with the findings of the medical board by whom the pensioners were examined, and no alteration was made in a board's original estimate of the degree of a man's disablement without further reference to the board, or the authority of a superior board, after a fresh examination of the man. The present practice was in fact in accordance with the suggestion made in the last part of the question.

Disabled ex-Service Postmen.—In reply to Sir A. Shirley Benn, who asked, on July 21st, if disabled ex-service men were subjected to medical examinations before being put on the permanent staff of the post office, Mr. Illingworth said that candidates for established appointments in the civil service had to obtain a certificate from the Civil Service Commissioners, and this involved a medical examination. The ordinary physical requirements were relaxed in favour of men disabled in the war, provided a reasonable period of service was likely to be given and the men were able to perform the duties allotted to them.

Service and Disability Pensions.—Sir Watson Rutherford asked, on July 26th, whether a man who applied for a service pension was to be subjected to a fresh medical examination; and whether there were numerous cases where the service pension now granted was accompanied by such a reduction of the disability pension that both put together did not exceed the total amount formerly drawn on the disability alone. Mr. Macpherson replied that the regulations regarding service pensions in addition to disablement pensions varied according to the length and nature of the man's service, and he regretted, therefore, that it was not possible to give a comprehensive answer to the question. He would be glad to reply on any specific case brought before him.

Health of Troops in Mesopotamia.—Mr. Churchill, replying to Mr. Lambert on July 28th, stated that for the first three months of this year the health of the troops was very satisfactory, the sick rate being less than in the United Kingdom. In April, the last month for which figures were available, the admission rate per 1,000 of strength rose, owing to the seasonal incidence of sandfly fever, giving an annual ratio of 890.4 per 1,000.

Treasury Grants to Port Sanitary Authorities.—The Ministry of Health has now notified port sanitary authorities that by arrangement with the Treasury it will grant 50 per cent. of the local authorities' expenditure in taking action to guard against infection from abroad. The circular notifies that this concession will apply to the payment of salaries of medical officers, the provision of ambulances, and for other administrative work.

Criminal Law Amendment.—Several sittings have been held by the Joint Committee of Lords and Commons which is considering the Criminal Law Amendment Bill introduced by Earl Beauchamp, the Criminal Law Amendment Bill (No. 2) introduced by Lord Sandhurst for the Government, and the Sexual Offences Bill introduced by Earl Beauchamp. A good deal of time has necessarily been occupied by the evidence of Sir Ernley Blackwell, Under Secretary for the Home Office, on information at the disposal of the department. He mentioned incidentally that the figures of venereal disease were not so grave as they had been, although still very striking.

Exposure of Carcasses.—Dr. McDonald asked, on July 21st, if the Minister of Health would take steps to prevent the exhibition of carcasses outside butchers' shops, and insist on the prohibition of all blowing of carcasses. Dr. Addison replied that he had recently appointed a committee to advise as to the measures necessary to protect the health of the people in connexion with the slaughter of animals and the distribution of meat for human consumption.

The Air of Manchester.—Mr. Clynes asked, on July 20th, whether the Minister of Health had received complaints from Manchester as to atmospheric conditions in that city; and whether his attention had been called to a complaint of the rector of St. Luke's, Platting, regarding the bad smells in the district. Sir Robert Saunders, for Dr. Addison, replied that complaint had been received, and it had been referred to the Departmental Committee on Smoke and Noxious Vapours Abatement, which was about to visit Manchester.

National Registration Acts.—Dr. Addison informed Sir B. Chadwick, on July 26th, that the National Registration Acts legally remain in operation until the official termination of the war; but they are not being kept up to date, and a question as to cost therefore does not arise.

Answers in Brief.

The cost of working the National Insurance scheme by the general body of approved societies represents on an average about 12 per cent. of the receipts from contributions.

Dr. Addison states that a few experimental consignments of sterilized milk were imported from Denmark in the early part of the year, but the undertaking proved unremunerative. He has no information as to the purity and quality of milk imported from Holland, but consignments from both countries are subject to examination at the port of entry under the Unsound Food Regulations. Samples of the Danish milk sent to this country have also been examined at the Ministry of Health, and there is a system of municipal inspection of dairy farms in Denmark and Holland.

The total number of applications and appeals of all kinds outstanding throughout the Civil Liabilities Department on July 10th, 1920, was 14,731. On January 10th, 1920, the total number outstanding was 42,446. The average number of cases dealt with per week in the present year is 5,170.

The total consumption of foodstuffs in the United Kingdom in the year ended December 31st, 1919, has been estimated as follows: Milk (available for liquid consumption), 920,000,000 gallons; sugar (for domestic use only), 790,000 tons; tea, 150,000 tons; flour, 5,140,000 tons; beef and mutton, 1,360,000 tons; bacon, 445,000 tons; butter, 180,000 tons; margarine, 330,000 tons. The value of these total quantities at the average retail prices prevailing were approximately as follows: Milk, £125,000,000; sugar, £50,000,000; tea, £45,000,000; flour, estimated value of bread sold by bakers, £90,000,000; flour, estimated value of flour sold (for example, flour other than that in biscuits), £25,000,000; beef and mutton, £195,000,000; bacon, £100,000,000; butter, £50,000,000; margarine, £35,000,000. The values quoted for bread and flour are exclusive of the Government subsidy on wheat.

PRESENTATION TO DR. J. A. MACDONALD.

THE following further subscriptions have been received up to and including the first post on Monday, July 26th, in response to the appeal published in our last issue (p. 129), towards the presentation to Dr. J. A. Macdonald on the occasion of his retirement from the office of Chairman of Council of the British Medical Association which he had held for ten years. Subscriptions of any amount not exceeding five guineas should be made payable to "The Macdonald Presentation," and sent to the Medical Secretary, British Medical Association, 429, Strand, London, W.C.2.

SECOND LIST OF SUBSCRIBERS.

	£	s.	d.
Brought forward from first list of subscribers	294	6	6
Abercrombie, Dr. P. H., London	2	2	0
Adams, Dr. John, Glasgow	5	5	0
Almond, Lieut. T. H., I.M.S.	1	1	0
Anderson, Dr. G. C., London	1	1	0
Andrew, Dr. J. Grant, Glasgow	2	2	0
Angior, Dr. F. L., O.B.E., Wigan	1	1	0
Anstey-Chave, Dr. T., Redhill	1	1	0
Baines, Dr. E., Whitby	1	1	0
Barfett, Dr. Mary D., St. Ives	0	5	0
Barling, Sir Gilbert, Bt., Birmingham	2	2	0
Bassett, Dr. F. P., St. Helens	3	3	0
Bateman, Dr. W. F., Rochdale	1	1	0
Baxter, Dr. S. E., Wellingborough	1	1	0
Beckett-Overy, Dr. H., London	2	2	0
Beveridge, Dr. J., Hurlford	1	0	0
Blease, Dr. A. T., Altrincham	1	1	0
Bond, Mr. C. J., C.M.G., Leicester	2	2	0
Bowie, Dr. J. M., Edinburgh	1	1	0
Bowlan, Dr. M. M., London	1	1	0
Bradbrooke, Dr. W. Bletchley	1	1	0
Brook, Mr. W. F., Swansea	1	1	0
Browne, Dr. H. W. Langley, O.B.E., West Bromwich	2	2	0
Browne, Dr. J. Walton, Belfast	1	1	0
Butcher, Dr. Flora, Newcastle-on-Tyne	0	2	6
Caiger, Dr. H., Sheffield	1	1	0
Calwell, Dr. W., O.B.E., Belfast	1	1	0
Cardale, Dr. H. J., London	1	1	0
Castle, Dr. R. F., Darfield	1	1	0
Charles, Dr. J., Stanley, co. Durham	1	1	0
Churchill, Dr. J. F., Chesham	1	1	0
Collier, Dr. W., Oxford	1	11	6
Collyns, Dr. R. J., Dulverton	0	5	0
Couzens, Mr. A. J., London	2	2	0
Crawshaw, Dr. S., Ashton-under-Lyne	2	2	0
Crook, Dr. A., Norwich	1	1	0
Cross, Mr. F. R., Clifton, Bristol	1	1	0
Crouch, Dr. C. P., Weston-super-Mare	1	1	0
Curme, Surgeon Lt.-Col. Decimus, Bournemouth	2	2	0
Cuthbert, Mr. C. F., Gloucester	2	2	0
Dain, Dr. H. G., Birmingham	2	2	0
Dando, Dr. E. A., Dudley	2	2	0
Davison, Dr. J. R., Belfast	1	1	0
Dawes, Dr. G. H., Sheffield	1	1	0
Deanesly, Mr. F., Wolverhampton	1	1	0
Dewar, Dr. W. J., Arbroath	0	10	0
Dickson, Mr. R. H., Newcastle, Staffs	1	1	0
Domville, Dr. E. J., O.B.E., Bridport	2	2	0
Drummond, Dr. David, C.B.E., Newcastle-on-Tyne	5	5	0
Duncan, Dr. W., O.B.E., London	1	1	0
Edwards, Dr. E. S., Empingham	1	0	0
Estcourt-Oswald, Dr. Agnes, Colchester	1	1	0
Evans, Dr. W. T., Bromley	1	1	0
Flemming, Dr. C. E. S., Bradford-on-Avon	5	5	0
Fletcher, Dr. J., London	1	1	0
Fogarty, Dr. D., London	2	2	0
Forsyth, Dr. C., Westcliff	1	1	0
Fulton, Dr. A., Nottingham	5	5	0
Gamgee, Mr. Leonard, Birmingham	2	2	0
Gauvain, Sir Henry J., Alton, Hants	1	1	0
Goodall, Dr. E. W., London	1	1	0
Gordon, Dr. J. E., O.B.E., Salisbury	1	1	0
Gosse, Dr. W., Parkstone	2	2	0
Goulden, Dr. Chas., O.B.E., London	1	1	0
Gray, Sir Henry M. W., K.B.E., C.M.G., C.B., Aberdeen	2	2	0
Habgood, Dr. W., Sutton, Surrey	1	1	0
Harris, Dr. A. C. E., Birkenhead	0	10	0
Haynes, Dr. G. S., Cambridge	1	1	0
Hopkins, Prof. Gowland, F.R.S., Cambridge	2	2	0
Horner, Dr. N. G., London	2	2	0
Hudson, Dr. James, Newcastle-on-Tyne	1	1	0
Hutton, Dr. Malcolm, Stamford	2	2	0
Ingle, Mr. C. Durban, Somerton	1	1	0
Ingram, Dr. P. R., London	2	2	0
Irish Medical Schools' and Graduates' Association (per Dr. Shepherd Boyd, Harrogate)	2	2	0
Irwin, Mr. S. T., Belfast	1	1	0
James, Dr. P., Senghenydd	0	10	6
Jaques, Mr. R., Plymouth	1	1	0
Jocelyne, Dr. A. E., Taunton	1	1	0
Johnston, Dr. G. Ainslie, Ambleside	1	1	0
Johnstone, Dr. G. W., London	1	1	0
Johnston, Colonel W. T., R.A.M.C., Bedford	1	1	0
Jones, Dr. Hugh, Dolgelley	1	1	0
Jones, Dr. Richard, Blaenau Festiniog	1	1	0
Kirby, Dr. E. D., Birmingham	1	1	0
Langran, Dr. W., Axminster	1	1	0
Larking, Dr. A. E., Totteridge, Bucks	0	10	6
Laurence, Dr. G., Chippenham	1	1	0
Lawson, Dr. D., Banchory	5	5	0
Linnell, Dr. A., Towcester	2	2	0
Lodge, Dr. G. H., Rotherham	1	1	0
Lord, Dr. C. Courtenay, London	1	1	0
*Lucas, Mr. A., Birmingham	2	2	0
Macdonald, Dr. John A., Grantham	1	1	0
McFarland, Dr. B., Lincoln	2	2	0
MacLennan, Dr. A., Runcorn	2	2	0
Mahomed, Dr. A. G. S., Bournemouth	0	10	6
Marks, Dr. Urban, Swansea	0	10	0
Major, Dr. H. C., Jersey	1	1	0
Martland, Dr. E. H., Oldham	2	2	0
Meade-King, Dr. R. L., Taunton	2	2	0
Meredith, Dr. H., Wellington, Somerset	2	2	0
Metcalfe, Dr. J., London	2	2	0
Minton, Dr. H., Woolwich	0	10	6
Mollison, Mr. W. M., London	2	2	0
Moore, Dr. S., Leeds	1	1	0
Murray, Dr. J., Llandrindod Wells	1	1	0
Newsome, Dr. H., Pill, near Bristol	1	1	0
Newton, Dr. D. Gray, Sheffield	2	2	0
Orton, Dr. J., Coventry	1	1	0
Palmer, Dr. C. J., Mansfield Woodhouse	1	1	0
Parker, Dr. G., Clifton, Bristol	1	1	0
Phillips, Dr. J., Bradford	1	1	0
Pockley, Dr. F. A., Sydney, N.S.W.	1	1	0
Pollard, Dr. G. S., Midsomer Norton	0	10	0
Price, Dr. D. R., Ammanford	1	1	0
Ratcliffe, Dr. J. R., Birmingham	1	1	0
Rawlings, Dr. F., Manchester	1	1	0
Rawlings, Dr. J. A., Swansea	1	1	0
Richardson, Mrs. Sophia M. V., M.D., Cheltenham	1	1	0
Robb, Dr. A. G., Belfast	2	2	0
Roberts, Dr. R. Lawton, Ruabon	1	1	0
Robertson, Dr. A., Prestwick	1	1	0
Roche, Dr. A. R., M.C., London	1	1	0
Ross, Dr. A. T., Leigh	1	1	0
Ross, Dr. D., London	1	1	0
Russell, Dr. T., Glasgow	1	1	0
Ryall, Mr. Charles, C.B.E., London	5	5	0
Sellers, Dr. W. H. Irvin, Preston	1	1	0
Shaw, Dr. J. T., Walthamstow	1	1	0
Shoolbred, Dr. T. B., Corstorphine	1	0	0
Sinclair, Professor T., C.B., Belfast	1	1	0
Smith, Dr. A. Tennyson, Orpington	2	2	0
Smith, Dr. L. Muir, Eastbourne	2	2	0
Spearman, Dr. B. J., Entebbe, Uganda	1	1	0
Starling, Dr. E. A., Tunbridge Wells	1	1	0
Stewart, Sir James Purves, K.C.M.G., London	2	2	0
Symes, Dr. J. O., Clifton	1	1	0
Taylor, Dr. Mark R., Acton	1	1	0
Thomson, Sir StClair, London	1	1	0
Tisdall, Dr. J. J., Liverpool	1	1	0
Unwin, Dr. H. R., Yeovil	1	1	0
Walker, Dr. J. F., Southend	1	1	0
Wardlaw, Dr. Robert, Greenock	1	1	0
Watson, Dr. W. N. West, Bradford	1	1	0
Watson-Williams, Dr. P., Clifton, Bristol	2	2	0
Wiley, Dr. V., Cork	1	0	0
Willcocks, Mr. A. D., Taunton	1	1	0
	£508	6	6

* Omitted in error from last list.

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

THE Sir Alfred Jones Laboratory of the Liverpool School of Tropical Medicine was officially opened on July 24th. In connexion with this event there has been published a *Historical Record*[1] (1898–1920) of the school. An account is there given of the formation of the school in 1899 as a result of the energy and public spirit of two men—Sir Alfred Jones and Sir Rubert Boyce, with whom the idea originated. In November, 1898, the former offered £350 per annum for three years to promote the study of tropical diseases, and fifteen days later a committee was formed, of which he was the chairman and Rubert Boyce (Holt Professor of Pathology at University College, Liverpool) a member. By the following April Boyce had been appointed Dean, Dr. H. E. Annett demonstrator, and Major Ronald Ross, I.M.S., lecturer in tropical diseases. After a formal opening on April 22nd teaching was commenced in May of the same year. Government recognition was slow in coming, and when the school's first expedition sailed for West Africa, on July 29th, 1899, the Colonial Office, the India Office, and the Foreign Office were all unable to offer any pecuniary assistance. The British Medical Association sent a cheque for £100, and the expenses of one member were paid by Sir Alfred Jones. This expedition—the first of thirty-two—consisted originally of Sir Ronald Ross, Dr. H. E. Annett, and Mr. E. E. Austen, together with Dr. van Neck of the Belgian Government. On August 17th a cable was received from Major Ross saying that the "malaria mosquito" had been discovered.

The record goes on to outline the history of the school from 1898 to the present time. The object of the compilers has been to commemorate the names of those who have been most closely associated with the activities of the Liverpool School of Tropical Medicine. The volume includes a list of the medical men who have been or who still are members of the staff, some of whom have died in and from their service. Thirty-five photographs and portraits of the school, its officers, and its memorials are

[1] *Liverpool School of Tropical Medicine: Historical Record (1898-1920).* Liverpool: The University Press. 1920.

given, as well as a compendious list of the scientific papers written by the members of the staff while at the school. It is greatly to be hoped that the publication of this book, with its record of laborious research, brilliant discoveries, and beneficent instruction, may lead the public to accord strong financial support to the school in the efforts it is now preparing for a further attack on the many problems in tropical medicine which still await solution.

During the war the laboratories were used as a military hospital. Now they possess every facility for carrying on research work, and in organization, it may be claimed, are second to none in the world. The laboratories are in close touch with a ward for patients suffering from tropical diseases within the precincts of the Royal Infirmary. Further, a laboratory at Sierra Leone is to be established, which will foster the study of disease and become a centre for teaching for those on the African coast who cannot come to England for instruction. The cost of these buildings had been defrayed out of money left by the late Sir Alfred Jones, and it was only fitting that the laboratories should ever be associated with his name.

Opening of the Sir Alfred Jones Laboratory.

Lord LEVERHULME declared the building open, under the chairmanship of Sir Francis Danson and in the presence of a large attendance of ladies and men, many of whom were in academic costume. Lord Leverhulme emphasized the great work Sir Alfred Jones had done in promoting measures for a more healthy life in the tropics. It could be truly said, as it was of Sir Walter Raleigh, that he "toiled terribly." Such work was the only kind of warfare that left the victors truly victorious.

Sir FRANCIS DANSON, in his introduction, gave a survey of the work that the school had accomplished during its twenty-two years of existence. Seven expeditions had been sent to Sierra Leone, four to the Gold Coast, three to Gambia, two to Jamaica, and single expeditions to many other tropical regions. Through the generosity of one of the great Liverpool steamship companies a centre at Manaos, under the direction of Dr. Wolferstan Thomas, whose work on yellow fever is well known, had been established.

Mary Kingsley Memorial Medallists were presented to Lord Leverhulme by Professor J. W. W. Stephens, and among the recipients were Dr. Arthur G. Bagshawe, Dr. Andrew Balfour, and Professor R. T. Leiper (London School of Tropical Medicine). Mrs. Albert Chambers was awarded the medal in recognition of the work of the late Dr. Albert Chambers, an illustrious Liverpool University graduate who recently died. In the evening Sir Francis Danson, Chairman of the School of Tropical Medicine, entertained to dinner many of Liverpool's leading citizens engaged in commerce with the tropics, and medical men interested in tropical medicine. He pointed out the immense importance of the work that was carried on at the school, and in order that this should not be in any wise hampered he made a spirited appeal not only to those at home but to the wealthy natives resident in the tropics, for further aid. He desired to raise £100,000, and as a pledge of his earnestness he would contribute £1,000 in memory of his son fallen in the war. The Vice-Chancellor, Dr. J. G. ADAMI, supported the appeal, and looked forward to the time when the natives of the tropics would reap abundantly the fruits of the research carried on in the new laboratories, and so make the University of Liverpool an Imperial University in the truest sense of the term.

A SUMMER school of civics is to be held this year at High Wycombe. It begins on July 31st, and will last a fortnight. There will be special courses for teachers, on the welfare of infants and young children, on the principles of reconstruction, and on experiments in the use of leisure. As to the last, medical men will be disposed to recall Mrs. Glass's direction about the hare.

THE Edinburgh Anti-Opium Committee has adopted a resolution expressing the hope that facilities will be given for carrying the Dangerous Drugs Bill speedily into law. The Committee asks for more definite restriction of raw opium and morphine and cocaine to medical requirements, and that the provisions of the bill may be extended to India and other Eastern dependencies in accordance with the terms of the Declaration of the British signatories at the Hague Convention.

England and Wales.

PRECAUTIONS AGAINST SMALL-POX IN LONDON.

SOME discussion has arisen between the London County Council and the Camberwell Borough Council regarding the accommodation in Camberwell for the isolation and observation of contacts with cases of small-pox. Under the Public Health (London) Act, 1891, local sanitary authorities are required to provide temporary shelter or house accommodation for the members of any family in which any dangerous infectious disease has appeared, who have had to leave their dwellings for the purpose of enabling such dwellings to be disinfected by the sanitary authority. In May, 1918, a communication on the subject was addressed to the London borough councils asking them to review their arrangements with the object of insuring that such provision had been made. The Camberwell Borough Council alone questioned the desirability of complying with this course. The accommodation provided in that borough is stated to be unsuitable for small-pox contacts, and alternative suitable accommodation has not been provided by the borough council. The view of the Camberwell authorities is that the visitation of contacts by the sanitary inspector is to be preferred to their isolation in a suitable building. The London County Council, however, is advised that medical inspection is essential to enable the disease to be detected in its earliest stages, and for this purpose contacts should in certain cases be kept under close medical supervision up to sixteen or eighteen days from the possible date of exposure to the risk of infection, and contact shelters have repeatedly proved to be of invaluable assistance to medical officers of health. The facts and considerations with regard to the whole matter are being communicated to the Minister of Health.

RED CROSS GIFTS FOR LONDON HOSPITALS.

At a special meeting of the general council of the King Edward's Hospital Fund for London, on July 23rd, Viscount Finlay, the chairman, moved the adoption of the report and awards of the Distribution Committee with respect to the gift of £250,000 entrusted to the Fund by the Joint Committee of the British Red Cross Society and the Order of St. John of Jerusalem, in aid of schemes of extension or improvement at London hospitals treating ex-sailors or ex-soldiers. Lord Finlay pointed out that this was the second distribution of £250,000 made through the agency of the Fund in 1920. On June 22nd an emergency distribution of the same amount had been made out of the capital assets of the Fund in order to assist the present need of the hospitals;[1] the present gift, however, came out of the surplus funds at the disposal of the committee of the British Red Cross Society and the Order of St. John of Jerusalem. It had been made a condition of this gift that none of it was to go to maintenance; it was to be used to assist definite schemes of extension or improvement, and it was to be confined to hospitals which could and would treat ex-sailors or ex-soldiers. The Distribution Committee had decided that only a small proportion of the £250,000 should go to bed extensions; the bulk of the gift had been allocated to such improvements as enlarged out-patients' departments, new operating theatres, improved nurses' quarters, and the equipment of special departments. The plans and estimates for these schemes, where they were of any size, had been thoroughly examined, and the hospitals had been visited. The Prince of Wales sent a message thanking the joint committee for their magnificent gift. The motion was seconded by the Lord Mayor, and carried unanimously. The thanks of the general council were tendered to the Joint Committee.

Among the larger grants made for specific purposes by the Distribution Committee were £9,000 to East Ham Hospital, £15,500 to the Great Northern Central Hospital, £11,000 to Guy's Hospital, £7,000 to Brompton Hospital for Consumption, £15,000 to the Miller General Hospital for South-East London, £8,000 to the Passmore Edwards Hospital for Willesden, £10,000 to the Prince of Wales's General Hospital, £12,000 to Queen Mary's Hospital for the East End, £8,500 to the Royal Free Hospital, £24,000 to the Royal National Orthopaedic Hospital, £24,000 to St. Bartholomew's, £8,000 to the West London Hospital, and £25,000 to the Woolwich War Memorial Hospital.

[1] BRITISH MEDICAL JOURNAL, July 3rd, 1920, p. 28.

CENTRAL MIDWIVES BOARD.

The Central Midwives Board for England and Wales met on July 22nd for a penal meeting and for the ordinary monthly meeting. Professor Briggs presided, and before commencing proceedings it was decided that:

The minutes of this meeting will record the first absence of Sir Francis Champneys during his eighteen years' chairmanship of the Board, one of many personal proofs of enviable vigour, also of earnest devotion to the Board's business. He is at present under treatment for an eye affection. The members of the Board regret his absence to-day and welcome the bright promise of his presence at the next meeting of the Board in October.

Six penal cases were considered. The names of two midwives were struck off the roll, the principal misdemeanours being failure to send for a doctor in an abnormal presentation and in two cases of puerperal fever, the result being fatal in each of the cases.

Ireland.

THE RECENT RIOTS IN BELFAST.

A LARGE number of gunshot wounds were admitted to the various hospitals on the nights of July 21st, 22nd, and 23rd. Many of these have unfortunately proved fatal, and a large number have no doubt been treated at their own homes. The Royal Victoria Hospital and the Mater Infirmorum Hospital received the largest number. About twenty-three have been admitted up to July 25th into the Royal Victoria Hospital, of whom one was carried in dead and nine have since died. The gunshot wounds are of the usual multiform character, and no special blood poisoning nor infection has appeared. One bayonet wound and several cases of cuts and lacerations from broken glass are also found. Several patients are still in a serious condition. The hospitals have so far been quite able to cope with this unusual strain on their resources, and much credit is due to the resident staffs for their energy and resource.

CENTRAL MIDWIVES BOARD FOR IRELAND.

The Central Midwives Board for Ireland held its first examination for midwives on July 8th and 9th. The examinations took place simultaneously at the Royal College of Surgeons, Dublin, the Queen's University, Belfast, and University College, Cork. The examiners were Drs. Trevor N. Smith, Reginald G. White, Gerald Tierney, J. M. Gilmor, J. D. Williamson, John McLeish, John Booth, and Walter Rahilly. Of the seventy-three candidates who presented themselves, sixty-two passed.

New South Wales.

THE UNIVERSITY OF SYDNEY.

AT the recent graduation ceremony 285 degrees were conferred in the various faculties. The Chancellor in the course of a short address referred to the needs of the University for increased accommodation. Since his previous address in June, 1919, in which he pointed out the almost complete impracticability of carrying on, with the limited space available, the classes at the rate of expansion manifested in recent years; the Legislature had made a grant for certain extensions, but the necessity for further development was still very great. The University had received material assistance from the splendid bequest of the late Sir Samuel McCaughey, and was also indebted to the donors of smaller amounts. The work of obtaining money even to relieve the congestion in the field of primary education was often difficult, but it should be realized by the general public that neither the aspirations of the University of Sydney nor of the community would be realized if the institution had ever to accept anything less than the best. The State having once established the University, could never allow it to decline in efficiency. The University had a fine tradition: men on its staff had won the highest fame, and the University degrees were recognized everywhere. It was incumbent therefore upon the State to see that this fine tradition was maintained.

The Minister for Education gave his assurance that the University would not suffer because there had been a change of Government. No body of men realized more fully than the present Ministry what men lost through not being able to take advantage of the opportunities for education at such an institution, and for that reason it was determined that the younger section of the community should get every opportunity to secure what had been denied to those who had gone before them.

THE NEW DEAN OF THE FACULTY OF MEDICINE.

Professor J. T. Wilson has been elected Dean of the Faculty of Medicine in the University of Sydney in succession to the late Sir Thomas Anderson Stuart. Professor Wilson is a native of Dumfriesshire, Scotland. He graduated M.B., C.M. at Edinburgh University in 1883. He was for a year or two demonstrator of anatomy in that university, and came to Sydney in February, 1887. He was demonstrator of anatomy here till 1890, when he was appointed Challis Professor of Anatomy, a post he will continue to hold. In 1909 he was elected to the Fellowship of the Royal Society of London. He is a member of the International Brain Commission and a Membre de l'Institut International d'Embryologie. He is a past president of the Linnean Society of New South Wales, and an honorary Fellow of the Royal Society of South Australia. In accepting the position of Dean of the Faculty of Medicine he has relinquished the more senior position of chairman of the professorial board, which he had occupied for several years.

THE INFLUENZA EPIDEMIC AND THE DEATH RATE.

The Government statistician reports that the death rate during the past year was 32.5 per cent. above the average for the last five years. This large increase was due to the influenza epidemic, which caused 6,387 deaths, or 24 per cent. of the total deaths from all causes, during the year. The period of the epidemic is taken officially by the public health authorities as from January 1st to September 30th; but 5,881 deaths, or 92 per cent. of the total from influenza, occurred during twenty weeks from March 19th to August 5th. During this period the epidemic followed its course in two distinct waves, each rising and falling in ten weeks. In the first wave, from March 19th to May 27th, 1,892 deaths occurred, and 3,989 during the second wave, from May 28th to August 5th. The statistics show that the mortality was highest in the most densely populated areas. The death rate was lowest among young children, it was practically equal for both sexes at school ages, and was highest among men of working ages, whilst the rates among women over 25 years of age were fairly uniform.

THE BIRTH RATE.

The birth rate for the metropolitan area of Sydney for 1919 was the lowest on record, being 14 per cent. below the average for the previous five years. The rate is equivalent to 23.05 per 1,000 of population. The decline in the birth rate since 1914 has been 5 per 1,000, but probably not all the decline can be attributed to the war, as the rate, after increasing from 1903 to 1912, declined slightly from 1912 to 1914. Illegitimate children numbered 7.41 per cent. of the total births, equivalent to 1.71 per 100 of population.

Correspondence.

THE CARLISLE EXPERIMENT IN LIQUOR CONTROL.

SIR,—I have from time to time sent to you particulars of the successful working of the regulations of the Central Control Board (Liquor Traffic) in the Carlisle area. The success of the experiment is evidently as distasteful to the advocates of prohibition as it is to "the Trade." Many of your readers have no doubt seen a list prepared by Alderman Malins, J.P., of Birmingham, a well-known prohibition leader. It is a most unfair attack on the fair fame of this ancient city. This list tries to show that Carlisle is a more drunken place than most other English boroughs. The list contains the names of 155 boroughs, gives the number of convictions for drunkenness in 1919 per 1,000 of the population, and Carlisle appears at the head of the list with the largest number of such convictions.

The list is, of course, a carefully selected one, and all the boroughs which have a larger proportion of convictions than Carlisle have been conveniently omitted. Why have such places been left out as Newcastle, Sunderland, Gateshead, North and South Shields, Middlesbrough, Workington, Barrow-in-Furness, Salford, Manchester, Liverpool, Rotherham, Durham, etc.?

A list of this sort is obviously misleading, but even apart from its partial character the comparison of convictions for drunkenness between town and town is of very little value as police administration differs so greatly in different towns. The only reasonable comparison is between the convictions for drunkenness in the same town at different periods. From the chief constable's reports it appears that the convictions for drunkenness at Carlisle in pre-war years averaged about 250, while in 1918 they were 80, and in 1919, 78. It should also be noted that whereas in 1919 the number of convictions for drunkenness all over the country was practically double that of 1918, at Carlisle the number actually decreased.

Let us take another list showing the same boroughs as those included in Alderman Malins's list, but tabulated on a different principle. In this case the number of convictions for drunkenness at each town for the year 1919 has been deducted from the number for 1914 (as given in the licensing statistics for that year) and the percentage decrease in the convictions for the latter year as compared with those of 1914 have been worked out. In this list Carlisle appears seventy-ninth instead of first.

In an amusing pamphlet entitled *The Statistical Exploits of a Fanatic*, published by P. S. King, Limited, price 2d. net, Mr. Arthur Sherwell makes very short work of Alderman Malins's list, and anyone who may have been led by a perusal of this list to the conclusion that the Carlisle experiment is a failure should read Mr. Sherwell's pamphlet to get a truer view of the matter.

But, indeed, the whole question is a wider one than the mere demonstration of the unreliability of a set of figures. The system of State management as carried out at Carlisle, as any fair-minded resident will admit, is undoubtedly having a good effect on the sobriety of the city, and there is good hope that when the present system has continued for a few more years the drunkenness of the city will be still further reduced. It has never been claimed that the Carlisle system, under which the private interest in the sale of intoxicants is wholly eliminated, has eradicated drunkenness in the city. This is quite impossible in a short space of time. What is claimed is that a most promising experiment is being carried on, and one which bids fair to point the way to a great improvement in the conditions under which the licensed trade may be carried on. Alderman Malins and his like would have this experiment branded a failure and the liquor trade handed back to the hands of private interests to be conducted for their own private gain because they hold that any reform which still allows the sale and consumption of alcohol is bad *ab initio*. They cannot see that half a loaf is better than no bread, and they prefer to continue the hopeless war against vested interests which they have carried on now for the last fifty or sixty years, the only result of which has been that their opponents are in every way in a stronger position now than ever before. They refuse to realize that it would be infinitely easier to persuade the electors to vote for prohibition (if this should be the will of the people) when there is no vested interest to weight the scales.—I am, etc.,

Carlisle, July 22nd. HENRY BARNES.

VACCINAL CONDITION OF SMALL-POX CARRIERS.

SIR,—It is, I think, an impracticable suggestion that the unrecognized case of small-pox can be eliminated by the instruction of the medical student, and at any rate I cannot agree that children should be exposed to unnecessary risk in order that the task of the medical man may be rendered easier.

For, after all, this is what Dr. Killick Millard's suggestion, in your issue of July 17th, amounts to. It is admitted that vaccination confers absolute immunity upon the individual for a variable period, and that as the protection wanes the individual becomes liable to an attack of small-pox of a severity commensurate with the amount of acquired immunity he still possesses. It follows, therefore, that infantile vaccination is primarily a protection to the child population, and that the effects of its discontinuance would fall most heavily, and with most distressing results, on this helpless section of the community. Incidentally, infantile vaccination may benefit individuals of adult age—even those whose vaccination is twenty to thirty years old—by modifying their attacks; but their protection is not the object of infantile vaccination.

The point at issue, then, is not whether it is possible "to protect the whole community, or anything like the whole community, by infantile vaccination," but whether that section of the community which it is designed to protect derive sufficient advantage to outweigh the particular disadvantage on which Dr. Millard bases his objection.

The answer to this must, I think, be an emphatic affirmative. In the first place, in considering the advantages to the child population, I feel that it is impossible for anyone, who has seen cases of small-pox in vaccinated and unvaccinated children, to put aside the individual aspect of the question and consider only the possible effects on the community as a whole; the difference between the two classes of cases is too great to admit of such cold-blooded reasoning, in the presence or with the memory of the preventable individual suffering—and it does not seem to be in the interests of the community that those parents who are desirous of protecting their children should be discouraged from doing so in order that others may reap a problematical advantage.

I have records of 3,057 cases of small-pox in children under 15 years of age; 673 of these were vaccinated, and of these 22 (19 over 10 years of age) were confluent, of which 7 died; the remaining 651 were discrete cases, of whom all except one recovered; of the 2,384 unvaccinated cases 845 were confluent and 480 died, and there were also 142 deaths amongst the 1,539 discrete cases; under 10 years of age there were 2 deaths amongst the vaccinated, as compared with 526 amongst the unvaccinated; the proportion of severe discrete cases amongst the unvaccinated was 72.4 per cent., as against 24.8 amongst the vaccinated; and under 10 years of age the corresponding figures were 72.1 and 10.7.

Would Dr. Millard have deprived these vaccinated children of the immense advantage they enjoyed? And would he, if some of them passed on their modified attack in a virulent form to an unvaccinated child, have laid the blame for that child's misfortune on the practice of infantile vaccination, or upon those who, directly or indirectly, were responsible for the child's unvaccinated condition?

In the absence of infantile vaccination Dr. Millard would rely upon administrative measures, of which vaccination of contacts would be perhaps the most important. As some indication of the danger of postponing vaccination until cases arise I would point out that amongst the unvaccinated cases mentioned above 426 were successfully vaccinated after exposure to infection, and that 87 died.—I am, etc.,

Gravesend, July 24th. ARCHIBALD KIDD.

FUTURE PROVISION OF MEDICAL SERVICES.

SIR,—It would be interesting to ascertain what is exactly a "proper doctor." A correspondent in the JOURNAL who gratuitously slanders the professional work of the majority of the medical men in the country apparently lays claim to the title.

We learn on the authority of Dr. C. L. Traylen (July 3rd, p. 29) that the panel doctor has a callous manner, and that he does not examine the chest, throat, heart, or even pulse, etc., of his patients. On what grounds does this correspondent base his assertions, and what opportunities has he had of forming this opinion? I do not believe that Dr. Traylen possesses a monopoly of the medical conscience of Willesden Green; and without having actual acquaintance with medical men in that district, I should say that there are panel practitioners there whose sense of professional duty and whose kindness of heart will compare quite favourably with these qualities as possessed by your correspondent. It has probably never occurred to him that the panel practitioner may be a strictly honourable, kindly man with a reputation to maintain.

I am acquainted with a number of panel practitioners, and I hope Dr. Traylen will not be unduly shocked when I assure him that there are men who do not differentiate between the treatment of their panel and private patients; anaesthetics, serums, vaccines, oxygen, are provided for

the panel patient as occasion requires, and perhaps I had better add that it is quite a common occurrence even to feel the pulse. The panel system receives a large amount of quite unmerited abuse. A panel is largely what the individual practitioner makes it.

A fact which is often overlooked is that there are, there always have been, and there always will be, two distinct types of men in the profession: There is the man who is a gentleman by nature, not necessarily by birth, who has high ideals of the healing art and of his duty to his patients, and there is the man who is in the profession to get all he can out of it. By their works ye shall know them. One type is hall-marked, the other bears a trade mark, both indelible. Nothing can alter this, whatever system is in vogue, whether panel, whole-time service, or what not; the two types will always be in evidence. Can there be any doubt which of the two is a "proper doctor"?

I have my own ideal of a "proper doctor," and have met him on many occasions in Harley Street, in the slums, and often in insurance practice, but your correspondent does not fill my picture, for he lacks one essential quality—the saving grace of charity.—I am, etc.,

Lenham, Kent, July 5th. J. TEMPERLEY GREY.

CALCIUM IN THE TREATMENT OF TUBERCULOSIS.

SIR,—Nature's remedy for tuberculosis is first fibrosis and then calcification. The amount of fibrosis may be regarded as evidence of the amount of resistance of the patient. Fibrosis comprises two factors: the imprisonment of the tubercle bacillus and its toxins on the one hand and the systemic attack of the white (giant) and other cells and their constituents on the other. Whilst, therefore, building up fibrosis and all it implies, on the one hand, by means of sanatorium environment and treatment, I wonder if, on the other, by giving lime salts in a colloid or finely divided form, we could not do something to cut short the life of the tubercle bacillus in glandular, pulmonary and other tissues.

What is the exact composition of the calcareous nodules found in healed tuberculous glands and scars? I believe that along the lines of combination of the chemical constituents with the vital we may in time work out a cure for tuberculosis.—I am, etc.,

Newcastle-on-Tyne, July 3rd. T. M. ALLISON.

MORTALITY OF VENEREAL DISEASES.

SIR,—In the BRITISH MEDICAL JOURNAL for July 17th, 1920, p. 80, there is a serious misstatement of fact (presuming correct reporting). Sir J. Crichton-Browne refers to the "three chief killing diseases" as cancer, tuberculosis, and venereal disease. This latter can only mean syphilis, as no deaths are ascribed to gonorrhœa in the Registrar-General's report.

The figures for 1917 show total deaths in England and Wales as follows:

Tuberculosis	55,934
Cancer	41,158
Pneumonia	39,832

Instead of being the third killing disease, syphilis comes a very long way down the list and was responsible for 2,127 deaths in the statistics above mentioned for 1917.—I am, etc.,

CHARLES RUSS, M.B.Lond., M.R.C.S., L.R.C.P.,
Honorary Physician, Electrical Department, Male Lock Hospital.

London, W., July 27th.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on July 20th, the following medical degrees were conferred:

D.M.—F. L. Apperly (*in absentia*).
M.CH.—N. A. Sprott.

UNIVERSITY OF CAMBRIDGE.

PROFESSOR G. H. F. NUTTALL reports that Mr. and Mrs. P. A. Molteno have undertaken to make an additional contribution of £6,000 in order that the Molteno Institute of Parasitology may not suffer from the increased cost of labour and material, and the original plan be maintained.

UNIVERSITY OF LONDON.

THE Senate has appointed Dr. W. S. Lazarus-Barlow to the new University Chair of Experimental Pathology, tenable at the Middlesex Hospital Medical School.

The following candidates have been approved at the examination indicated:

M.D.—(*Medicine*): T. I. Bennett, F. V. Bevan-Brown, G. Bourne, J. A. Drake, A. R. Elliott, *G. Marshall, J. G. Moseley, H. B. Russell, J. H. Sheldon, T. P. Williams, Irene Yates. (*Pathology*): S. F. Dudley. (*Mental Diseases*): T. Beaton, M.D., H. W. Hills. (*Midwifery and Diseases of Women*): Marian N. Bostock, *A. Goodwin, W. Salisbury, R. S. Townsend. (*State Medicine*): E. N. Ramsbottom, *H. Stott. (*Tropical Medicine*): C. C. Chesterman, M. D. Mackenzie.

* University medal.

LONDON HOSPITAL MEDICAL COLLEGE.

The prizes and certificates awarded to the successful candidates for the session 1919-20 were distributed by Dr. Robert Hutchison on July 5th. The following is a list of the awards:

"Price" Entrance Scholarship in Science (£100), L. Mushin. Second Entrance Scholarship in Science (£50), H. Taylor. Price University scholarship in Anatomy and Physiology (£52 10s.), Miss C. M. Ottley. Medical Prize (£20), D. Hunter. Prize in Clinical Obstetrics and Gynæcology (£20), M. C. Hartley; Honorary Certificates, J. R. Zeitlin and Miss M. E. Kennedy. "Andrew Clark" Prize in Clinical Medicine and Pathology (£26), D. Hunter; Honorary Certificates, P. Steinberg and F. H. W. Tozer. Surgical Prize (£20), D. Hunter; Honorary Certificate, Miss M. E. Kennedy. "Anderson" Prizes in Elementary Clinical Medicine (£3 each), Miss D. J. Fox, Miss D. Gibson, F. H. Mather; Honorary Certificates, H. D. Lawson, Miss H. R. Ashton, Miss D. S. Russell, and Miss M. E. Dixon. In-patient Dressers' Prizes (£5 each), C. S. Cloake, Miss D. Gibson and W. Thomas (equal, prize divided), Miss H. R. Ashton, Miss G. H. Jones; Honorary Certificates, Miss G. Denham and Miss D. S. Russell. Practical Anatomy (£6 Prize), Miss S. H. G. Robinson, (£2 Prize) P. H. O'Donovan, (£2 Prize) A. J. Reed; Honorary Certificates, D. R. Blunn, G. N. Golden, S. A. Grant, K. W. Todd. Letheby Prizes: Organic Chemistry (£15), R. T. Brain; Honorary Certificates, L. Mushin; Chemical Pathology (£10), C. S. Cloake; Honorary Certificate, F. C. Hunt. Sutton Prize, Pathology (£20), M. Tree. Buxton Prizes in Anatomy and Physiology (£31 10s.), G. N. Golden; Honorary Certificate, Miss D. Peake. Arnold Thompson Prize in Diseases of Children (£15), Miss O. G. Potter; Honorary Certificates, Miss D. J. Fox, Miss M. E. Kennedy.

LONDON SCHOOL OF TROPICAL MEDICINE.

The following were successful at the examination at the termination of the sixty-third session:

*T. J. D. Lane (gained Duncan Medal), *R. Jamison, *Miss E. J. O'Driscoll, *F. E. Reynolds, M. D. Mackenzie, J. M. MacKay, R. B. Hawes, J. Glavina, J. Forrest, V. E. Critien, S. A. Eldaah, J. V. Holmes, G. C. R. Wilson, J. H. Parry.

* Passed with distinction.

KING'S COLLEGE.

The following appointments have been made by the Delegacy: Dr. O. Inchley, lecturer in pharmacology; Dr. J. E. Hadfield, lecturer in psychology.

UNIVERSITY OF MANCHESTER.

THE following have been approved at the examinations indicated:

B.Sc. (PUBLIC HEALTH).—E. N. Ramsbottom.
D.P.H.—W. Ash, Sybil Bailey, J. C. Beckitt, Hilda Brade-Birks, J. P. Charnock, W. J. McIvor, C. G. Magee, Kathleen O'Donnell, W. J. A. Quine, A. Renshaw, L. S. Robertson.

UNIVERSITY OF SHEFFIELD.

THE following candidates have been approved at the examination indicated:

THIRD M.B., CH.B.—E. S. Clayton, Mary P. Gell, R. D. S. Inman, R. T. Lee, Elsa F. Page, R. Platt (distinction in Pathology), P. H. Sharp.

UNIVERSITY OF BRISTOL.

O. C. M. DAVIS, D.Sc., has passed the examination for the degree of M.D.

UNIVERSITY OF EDINBURGH.

AT the university court held on July 19th it was resolved, in view of the greatly increased cost of laboratory material, to make an additional charge in respect of laboratory training in the Faculties of Arts and Science, commencing on October 1st.

The court expressed its gratification at the further grant of £500 made by the Combe trustees towards the equipment of the laboratory in connexion with the Combe Lectureship in Physiology.

Dr. James Miller has resigned the post of Lecturer in Morbid Anatomy on his appointment to the Chair of Pathology in Queen's University, Kingston, Ontario.

Dr. W. T. Ritchie has been granted recognition for three years as an extra-mural lecturer in medicine.

The regulations drafted by the Faculty of Medicine for the diploma in tropical medicine and for the diploma in psychiatry were approved.

Dr. James E. M'Cartney was appointed Lecturer in Bacteriology.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

THE following gentlemen, having passed the requisite examinations, have been admitted Fellows:

H. B. Atlee, J. C. Bell, F. Cameron, A. R. Campbell, F. E. Feildon, J. A. Ferriere, T. G. Fetherstonhaugh, T. W. Hancock, S. L. Harke, W. K. Irwin, G. B. Isdale, H. H. Jamieson, C. King, J. T. M'Auslin, A. J. M'Creadie, W. A. Mein, A. C. N. Misbah, D. M. Morison, G. T. Mowat, W. G. Oakeley, G. H. Peall, H. N. M. Puckle, M. E. Robinson, R. J. Silverton, A. F. Sinclair, F. W. Stone, F. K. Te Water, C. Uren.

Medico-Legal.

LIBEL ACTION AGAINST A MEDICAL OFFICER OF HEALTH.

A CASE of some little interest came before Mr. Justice Roche and a common jury in the King's Bench Division on July 15th. The plaintiff was a Mrs. Mabel Copeland, and she brought an action for damages for libel against Dr. Thomas Orr, the medical officer of health of the borough of Ealing.

It appeared that the plaintiff entered the service of the town council as a lady sanitary inspector in June, 1911, and from that time until Dr. Orr's appointment as M.O.H. in September, 1915, her duties consisted mainly in visiting newly born babies. On her return from her holidays in September, 1915, Dr. Orr, having entered upon his duties whilst she was away, the plaintiff was instructed by Dr. Orr to take up the returned scarlet fever cases. As a result the plaintiff saw the Chairman of the Public Health Committee, whom she asked for a testimonial with a view to obtaining another appointment. However, she changed her mind, and things went fairly smoothly for a time. In April, 1917, as the result of a new scheme of health work which Dr. Orr then introduced, the plaintiff again decided to resign, and wrote to the town council for a testimonial. The council asked Dr. Orr to report to them on the plaintiff and her work, and the doctor prepared a written statement, in which he said that the plaintiff was late in arriving at the office, absented herself without permission, and was unsatisfactory in the performance of her duties. This statement was handed to the Public Health Committee at their next meeting.

At about this time a letter had been written by the plaintiff's sister to Dr. Orr which stated that the plaintiff had been ill as a consequence of Dr. Orr's harsh and aggressive attitude towards her. This letter was laid before the Committee, who called upon the plaintiff to attend before them and support the statements contained in her sister's letter. She did not do so, and the council eventually decided to dismiss her from their employment. The plaintiff then brought her action against Dr. Orr for libel contained in the report which he had submitted to the Committee in April, 1917, and the doctor pleaded that the report was made bona fide at the request of the Committee in circumstances which rendered it privileged.

The plaintiff in the witness box spoke of the defendant's manner towards her having been harsh and brusque, and referred to an interview on one occasion on which the defendant had said that either he or she had "got to go." The plaintiff's sister was also called, and the evidence of the former chairman of the Public Health Committee, which had been taken on commission, was read.

This closed the plaintiff's case, and Mr. Hemmerde, K.C., who appeared as counsel for the defendant, submitted that the plaintiff had not proved that the defendant had acted from any malicious motive in making his report, and that the case ought therefore to be withdrawn from the jury. The judge, however, said he thought it best to hear the case out, although he was inclined to think there was no evidence of malice. The defendant then went into the box and detailed his association with the plaintiff, and in particular dealt with the circumstances under which he made the report to the Committee. The plaintiff was lacking in method, and her records were in arrears. He honestly believed the statements contained in his report, which were founded chiefly upon his own observations. He had no personal feeling against her, nor desire to get her out of her employment. Two other witnesses spoke to the unsatisfactory way in which the plaintiff had carried out her duties.

In his summing up to the jury the judge asked them to say whether in making the report to the council the defendant acted bona fide, and pointed out that being actuated by malice did not necessarily mean ill will, although ill will was a form of malice. It meant an indirect and improper motive, and might be expressed in this way. The defendant had of course to report to his council because he was asked to do it. The report was therefore privileged. But a person in such circumstances must not abuse the occasion, and the question was whether he had done so. The judge also intimated that there might be a question which he would have to decide thereafter as to whether there was any evidence upon which they could find in favour of the plaintiff.

The jury found £25 damages in favour of the plaintiff, and the judge postponed entering judgement pending legal argument. On July 19th the case was mentioned to the court by Mr. Hemmerde, who moved that judgement be entered for the defendant, on the ground that there was no evidence of malice, and Mr. Justice Roche, in the course of a somewhat lengthy argument by counsel on both sides, said: "Speaking as a great believer in juries, this is one of the cases which occurs now and then in which one's faith is a little shaken. I say no more than that. It is not for me to set the jury's verdict aside as being an unreasonable verdict, but I am entitled to say that I am very dissatisfied with it. It is difficult, however, to say that there was no evidence which could be submitted to the jury."

Judgement was therefore entered for the plaintiff for the sum of £25. We understand that an appeal has been entered by the defendant.

The Services.

HONOURS.

O.B.E. (MILITARY).

CAPTAIN WILLIAM NIVEN GREER, R.A.M.C.(S.R.), and temporary Captain David Vincent O'Malley, R.A.M.C., have been appointed O.B.E. (Military Division) in recognition of valuable services rendered in connexion with military operations in Burma.

MENTIONED IN DISPATCHES.

The names of the following officers have been brought to the notice of the Secretary of State for War for valuable and distinguished services rendered in connexion with the military operations in the theatres of war indicated:—*South Persia Force*: Major R. G. G. Croly, I.M.S., and Captain (acting Lieut.-Colonel) J. B. Hance, I.M.S., attached South Persian Rifles. *Kuki Punitive Operations*: Captain T. Fleming, R.A.M.C., Captain W. N. Greer, R.A.M.C. (S.R.), and temporary Captain D. V. O'Malley, R.A.M.C.

Temporary Captain John Marsters Mitchell, R.A.M.C., has been appointed O.B.E. (Military Division) in recognition of valuable services in connexion with military operations in South Russia.

Captain Oswald Russell, the son of Major-General Sir Michael Russell, K.C.M.G., C.B., late Deputy Director-General of the Army Medical Services, War Office, has been awarded the Military Cross for conspicuous gallantry and devotion to duty near Sasiliyah (Mesopotamia) on March 7th, 1920.

Obituary.

SIR ALEXANDER DEMPSEY, M.D., J.P.,

Gynaecologist to the Mater Infirmorum Hospital, Belfast.

THE announcement last week of the death of Sir Alexander Dempsey, M.D., at his residence, Coldagh, Somerton Road, Belfast, occasioned widespread regret amongst all classes and sects in Belfast and the North of Ireland. About the end of June he became confined to the house, and gradually became weaker, and he died on July 18th.

Alexander Dempsey was born at Coldagh, Ballymoney, County Antrim, in 1852; he was educated at St. Malachy's College, Belfast, and began his professional career in Queen's College, Galway, and subsequently studied in the Roman Catholic University Medical School, Dublin, and obtained the M.D. in the old Queen's University, and the L.R.C.S.I. in 1874. He began practice in Belfast in Donegal Street, and removed to Clifton Street, which remained his professional residence to the end. Along with the late Dr. John Moore and the late Dr. William McKeown, he established the North of Ireland Branch of the British Medical Association, in which he always took a keen interest; for many years he acted as its honorary secretary and treasurer, and subsequently he was elected its president. When the Association met in Belfast in 1884 he was one of the honorary secretaries. Sir Alexander Dempsey was much associated with the public life of the city: he was appointed a justice of the peace in 1880; for many years he was a member of the joint board of the Belfast and County Antrim Asylum, and of the visiting committee of the Belfast prison. He was elected a member of the governing body of the University College, Dublin, and nominated at its inception a member of the National University Senate. Two years ago he was also nominated to the Senate of the Queen's University, Belfast.

His chief professional work was done as gynaecologist to the Mater Infirmorum Hospital, Belfast, to the rebuilding and reorganization of which he devoted much time and energy. He enjoyed a very large and lucrative practice both as a family physician and, amongst those of his own denomination, as a consultant. On several occasions he acted as local examiner in obstetrics and gynaecology in the Queen's University and as extern examiner in the National University of Ireland. In 1911 he received the honour of knighthood.

Sir Alexander Dempsey was esteemed for his genial disposition, his openness and fairness, and his high professional abilities. He was a favourite with all classes and creeds, both amongst his professional brethren and the

public generally. He is survived by a brother, two sons (one Dr. Alex. J. Dempsey, late of the R.A.M.C.), and a daughter, with whom much sympathy is felt.

WE regret to learn of the unexpected death of Lieut.-Colonel W. D. SUTHERLAND, M.D., C.I.E., I.M.S., Imperial Serologist, Calcutta. He was taken ill on June 22nd with acute appendicitis and, in spite of very early operation, he died in the Calcutta Medical College Hospital on June 27th, when he had almost completed his full service for pension, leaving a widow in England and a son in the army. He took the M.B., C.M. degrees at Edinburgh University in 1888 and subsequently the M.D., entered the Indian Medical Service in March, 1890, and saw military service in Burma. In July, 1894, he entered the civil medical department of the Central Provinces, where he served for many years. He made a special study of medico-legal tests for blood stains, including the serological test, and wrote a small book on the subject while on leave, which led to his being placed on special duty in Calcutta for investigation of the serological test, and in 1914 he was appointed to charge of the newly-created post of Imperial Serologist, which included medico-legal blood tests for the whole of India. His technique was extremely good, while he was an accomplished linguist and well up in foreign medical literature, and his valuable work in this line was recently rewarded by the grant of the C.I.E. His sudden and untimely death is a great loss to science and to his service, as well as to the Calcutta School of Tropical Medicine, in which he was to have lectured, while he was also a member of the governing body of the Endowment Fund, under which the school is about to open as a research institute until such time as the Government of India can provide a teaching staff. Colonel Sutherland was a most accomplished man, a valued colleague and a true friend to many, and a most entertaining and popular companion; his scientific work was most careful and reliable. He will be greatly missed by his many friends, while his unexpected death when so near his retirement is one of the many calamities inseparable from work in the tropics. His last remains were given a military funeral, which was largely attended.

Medical News.

THE house and library of the Royal Society of Medicine will be closed during the whole of August for repairs and cleaning.

A POST-GRADUATE course conducted by members of the staff will be held in the Radcliffe Infirmary and County Hospital, Oxford, commencing on Friday, October 1st, and terminating on Saturday, October 9th. Further particulars can be obtained on application to the Secretary, Post-graduate Course, Radcliffe Infirmary, Oxford.

WE are asked to state that although several of the wards of the National Hospital for the Paralysed and Epileptic, Queen Square, London, are closed through lack of funds, the whole of the out-patient department is working as usual.

DURING the month of September a very complete course of post-graduate teaching will be conducted by the staff of the Glasgow Royal Infirmary. Full details as to classes and enrolment are given in our advertisement columns.

THE School Dentists' Society has resolved to increase the annual subscription for membership from 5s. to 10s. 6d., dating from January 1st, 1921.

THE Faraday Society and the Physical Society of London have arranged to hold a general discussion next October on colloidal physics and chemistry.

The treasurer of St. George's Hospital has issued a statement contradicting the rumour that the hospital is to be moved. Private negotiations which were entered upon last year for amalgamation with another hospital have fallen through. The site of St. George's Hospital was offered for sale some years ago, but no adequate offer was received; various restrictions and conditions apply to about half the site, and so reduce its saleable value. The governors have decided to extend and improve the hospital at the earliest opportunity, and eventually to rebuild it on the present site at Hyde Park Corner.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

"ELTEE," a Territorial R.A.M.C. officer entitled to the 1914–15 Star, Victory and Allied Medals, inquires where he should apply for these.

*** The Medal Branch (A.G. 10) of the War Office is at 27, Pilgrim Street, Ludgate Hill, E.C.4.

INCOME TAX.

C. H. D. inquires as to the basis on which income tax should be paid in the case of a medical partnership.

*** First of all the liability of the practice as a whole is determined—that is to say, the amount of the average profits, total receipts less united expenses, over the previous three years. Then the result is divided into the proportions provided for by the deed of partnership and the special individual expenses deducted therefrom. The united return should be the aggregate of the resulting net shares of the gross profits. Although the assessment is made on the basis that the firm is liable as a distinct entity, it is calculated, as regards allowances, rates of tax, and so on, as if it were simply the aggregate of assessments on the individual members of the firm.

P. Q. R. inquires whether he is liable for tax on fees, etc., received while acting as locumtenent and, if so, on what basis. He gave up an appointment last year and has been acting as locumtenent at various times since.

*** The income is undoubtedly assessable though it is to a large extent casual in our correspondent's case. The basis is the usual three years' average except that in the first year for that work the liability is on the first year's earnings, for the second year on the same amount, and for the third year on the average of the first two years. The value of lodgings and board received in kind is not liable to tax, and, in our opinion, P. Q. R. is entitled to deduct the reasonable expenses incurred in travelling to take up the various locumtenancies.

"RETIRED PAY" inquires how an income made up as follows will be treated for income tax purposes: Army pension £365; investment income, £25 taxed and £2 10s. untaxed. "Retired Pay" is married, lives abroad, and pays £10 for life assurance.

*** Our correspondent appears to assume that the £365 is exempt because he lives abroad; this will not be the case if the pension is paid from British and not Colonial or Indian sources. The allowances to which he is entitled are £225 plus £10, and the assessable income, £392 10s., less one-tenth of £365 = £36 10s.—that is £356 net, leaving a full liability of £356 —£225 = £131 at 3s., less the life assurance allowance of £10 at 3s., that is, £121 at 3s. If the army pension be exempt, the allowances have to be divided between the liable and non-liable income—that is, in the ratio of £365 to £27 10s., and his liability would be a matter of a few shillings only. We assume, of course, that he has no foreign or colonial income which has not been mentioned in his letter.

H. T. has been informed by the assessor that unpaid book debts must be included as earnings in his income tax return, and asks whether this is correct.

*** The legal position is that book debts are liable, but subject to a reasonable allowance for estimated bad debts. In the case of a medical practice it is impossible to make such an estimate with any degree of accuracy, and it is a well understood practice on the part of the Board of Inland Revenue to assume that, in the case of a medical practitioner who has been in possession for some years, the cash receipts in any one year fairly represent the real value of the year's bookings. In the long run the basis of cash receipts must be fair to both parties, always provided that it is not applied to the first two or three years of a practitioner's earnings, when there are no payments of old debts coming in to offset the non-inclusion of unpaid debts booked during the particular year in question. We think that the assessor to whom our correspondent refers must be under a misapprehension as to the attitude of the authorities on this question.

Medical Practice in Italy.

"V. P." asks for information regarding the prospects for practice in Italy by British medical women, and inquires whether a British qualification entitles one to practise among the Italian population?

*** Italy accords to those whose names are on the *Register* kept by the General Medical Council of this country the right of admission to the Italian register.

Tennis Elbow.

Dr. John G. Havelock (Swanage) writes: Can you refer me to a textbook which contains a full description of "tennis elbow"? It is a very common complaint, yet I can find no reference to it in the modern surgical works at my disposal. In the last edition of that very comprehensive *Index of Symptoms*, edited by H. French, I can find references only to rupture of the plantaris longus and subacromial bursitis. I constantly meet players who complain of having a "tennis elbow," and would like to know whether it is a definite lesion or a term given to a variety of lesions.

*** We have referred this question to Mr. E. Muirhead Little, to whom we are indebted for the following reply: "I do not think that in the literature there will be found more than a few lines on this subject. Tennis elbow, fencer's elbow, and several other instances of similar kind are generally put down to muscle strain. Tennis elbow is attributed to sprain of the pronator radii teres. A short description will be found in R. H. A. Whitelocke's book *Sprains and Allied Injuries of Joints* (Henry Frowde, and Hodder and Stoughton, 1909). I believe that these affections are not always muscle sprains, but that some of them are injuries of ligament or of the attachment of ligament to bone. Prolonged rest from the movement which causes the pain is the best treatment. For instance, a fencing master who was under my care was quite cured by abstaining from fencing with the right hand for about six months. He used his left hand exclusively for that period."

Cottage Hospital Organization.

Dr. Wm. J. Aitken Quine (Osborne House, Chinley) writes: I am endeavouring to arouse interest locally for the erection of a cottage hospital of twelve to sixteen beds. Could any of your members associated with similar institutions furnish me with information under any of the following heads: (*a*) Preliminary organization; (*b*) suitable plans and equipment; (*c*) cost of erection and maintenance? Copies of recent annual reports and plans would be specially useful.

LETTERS, NOTES, ETC.

The Women's Service Bureau was opened in the first week of the war, and has been the means of training, advising, and placing many women in suitable work. About 10,000 employers and 60,000 women have been approached and dealt with since the bureau was started in August, 1914, and many positions, such as surgery attendants, cashiers, book-keepers, correspondence and confidential clerks and secretaries, stenographers, have been filled. No fees are charged either to employer or employed; the bureau is maintained by voluntary contributions from the members of the society and from those whom it has been able to help. Inquiries should be addressed to the Secretary, Miss P. Strachey, London Society for Women's Service, 58, Victoria Street, S.W.1.

Treatment of Whooping-cough.

Dr. W. J. Midelton (Bournemouth) writes: I have read with interest the note on the treatment of whooping-cough in the Epitome, British Medical Journal, July 24th. Anything that promises a reasonable prospect of success in this distressing malady is worthy of consideration. For several years I have painted the chests of children suffering from it with a mixture containing approximately ¼ grain cantharidin and 40 minims of croton oil to an ounce of almond oil. It is repeated once or twice at weekly intervals. In every case the relief has been prompt and cure effected in under a month.

Acidosis in Disease: A Correction.

Our attention has been called to a printer's error in Dr. E. P. Poulton's contribution to the discussion on this subject in the Section of Physiology and Pharmacology at Cambridge (British Medical Journal, July 17th, p. 72, col. 2). In correcting the author's proof the two lines immediately following the setting out of Hasselbalch's formula were, unfortunately, transposed. The correct reading is as follows:

$$p_H = p_{K_1} + \log \frac{\text{Combined } CO_2}{\text{Free } CO_2}$$

—a very simple matter. Hence the alkali reserve may be expressed as the p_H of blood at 40 mm. This value probably lies between 7.41 and 7.31 in health.

We regret the error the more as considerable pains had been taken to make this report accurate.

Atropine in Sea-sickness.

Dr. Gerald W. Maw (Surgeon P. and O. S. N. Co.) writes: In the early part of this year a note appeared in the British Medical Journal (January 3rd, 1920, p. 23) in which it was stated that atropine, given hypodermically, was a cure for sea-sickness; its use was also suggested as a prophylactic measure. During the last three months I have repeatedly tried atropine for sea-sickness. I began by giving $\frac{1}{30}$ grain of atropine for an attack of sea-sickness; in every case it entirely failed to control the vomiting, and I therefore abandoned its use when an attack had already commenced. During the present voyage I have tried it exclusively for prophylaxis. The day before entering the Bay of Biscay I gave the passengers notice that I was prepared to give hypodermic injections of atropine as a preventive against sea-sickness. Four ladies requested me to give them the treatment, each of whom said that, in a rough sea, she was repeatedly sick. The following is a brief account of the result in each case.

Mrs. A., aged 19, who was seven months advanced in pregnancy, was given $\frac{1}{30}$ grain of atropine on three successive days; fortunately sickness was entirely prevented, as, having regard to her condition, a bad attack of vomiting might have been accompanied with disastrous results.

Mrs. B., aged 27, had three successive injections of atropine; she vomited once only.

Mrs. C., a highly nervous lady of 20, was given one injection of atropine, but she afterwards refused to continue the treatment; she obtained immunity for twenty-four hours, but was afterwards so violently sick that morphine had to be administered.

These three ladies left the ship before the next spell of bad weather was experienced.

Mrs. D., aged about 30, was given three successive doses of $\frac{1}{30}$ grain atropine. She escaped sea-sickness on that occasion, but when in the Indian Ocean she vomited as she was going to her bath. I gave her an injection of atropine, but the vomiting persisted.

I have come to the conclusion that it is useless to administer atropine when sickness has once started. Undoubtedly the drug has some value as a prophylactic, but the results obtained are by no means uniformly satisfactory.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 27, 30, 31, 32, 33, and 34 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 28, 29, and 30.

The appointment of certifying factory surgeon at Lougher (Glamorgan) is vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	7	6
Each additional line...	0	1	3
Whole single column	6	0	0
Whole page	16	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

Note.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.